100763

TABLES

TABLE 1
SUMMARY OF SOIL ANALYTICAL DATA - WATER MAIN (FIRST INVESTIGATION)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE
PAGE 1 OF 3

Sample ID		048	049	050	051	052	062 (DUP-1)	053	054	055	056	057	063 (DUP 2)	058	059
Sample Location		*TP-1*	*TP-1*	*TP-2*	*TP-2*	*TP-3*	*TP-3*	*TP-3*	*TP-4*	*TP-4*	*TP-5*	*TP-5*	*TP-5*	*TP-6*	*TP-6*
Lab Sample Number		29868	29869	29870	29871	29872	29882	29873	29874	29875	29876	29877	29883	29878	29879
Sampling Date		8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95
Depth (feet)		0.75-1.25	5.5-6.0	1.5-2.0	5.0-5.5	1.5-2.0	1.5-2.0	5.5-6.0	1.5-2.0	5.5-6.0	1.5-2.0	5.5-6.0	5.5-6.0	2.5-3.0	5.5-6.0
PARAMETERS	Units														
VOLATILE COMPOUNDS *															
Methylene Chloride	ppm	0.062 B	ND	0.054 B	ND	0.005 B	0.002 B	ND	0.004 B	ND	0.043 B	ND	ND	0.047 B	ND
Acetone	ppm	0.37 NK	ND	0.77 NK	ND	0.011 J	0.041 J	ND	0.044	ND	0.32 NK	ND	ND	0.56 NK	ND
Carbon Disulfide	ppm	0.005 J	590	0.072	230	ND	0.026 J	570	0.004 J	2500	0.02 J	1600	2700	0.061	20
2-Butanone	ppm	*0.096 J*	*ND*	*0.29 J*	*ND*	*ND*	*0.01 J*	*ND*	*0.005 J*	*ND*	*0.083 J*	*ND*	*ND*	*0.14 J*	*ND*
Trichloroethene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.007 J	0.0017
4-Methyl-2-Pentanone	ppm	ND	ND	0.027 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.019 J	ND
Toluene	ppm	ND	ND	0.025 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Confident Conc VOAs	ppm	0.471	590	1.184	230	0.011	0.077	570	0.053	2500	0.423	1600	2700	0.797	20.0017
Tentatively Identified Compounds (TICs)															
Unknown Hydrocarbons	ppm	1.04 J	ND	2.53 J	ND	ND	ND	ND	ND	ND	0.124 J	ND	ND	ND	ND
C12H26 Alkanes	ppm	0.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C14H28 Alkenes	ppm	0.41 J	ND	ND	ND	ND	ND	ND	ND	ND	0.0872 J	ND	ND	ND	ND
Unknown Alkanes	ppm	0.34 J	ND	1.41 J	ND	ND	ND	ND	ND	ND	0.141 J	ND	ND	ND	ND
Unknowns	ppm	1.35 J	ND	1.3 J	ND	ND	ND	ND	ND	ND	0.423 J	ND	ND	0.036 J	ND
Unknown Alcohols	ppm	ND	ND	1.85	ND	ND	ND	ND	ND	ND	0.15 J	ND	ND	ND	ND
Napthalene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.86 R
Total TICs	ppm	3.87	ND	7.09	ND	ND	ND	ND	ND	ND	0.99	ND	ND	0.036	ND
SEMIVOLATILE COMPOUNDS															
Phenol	ppm	0.11 J	ND	ND	1.5	0.098 J	0.024 J	0.56 J	0.029 J	0.98 J	0.092 J	1.5 J	0.53 NJ	0.067 J	0.380 NJ
2-Methylphenol	ppm	*ND*	*ND*	*ND*	*0.009 NJ*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*0.007 NJ*	*ND*
2,4-Dichlorophenol	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01 NJ	ND	ND	0.011 NJ	ND
Naphthalene	ppm	ND	0.064 J	0.99 J	0.015 J	0.004 NJ	0.006 NJ	1 J	0.004 NJ	2.4 J	ND	0.39 J	0.47 J	0.061 J	6.5 J
2-Methylnaphthalene	ppm	ND	0.017 NJ	1.5 J	0.012 NJ	ND	ND	0.77 J	ND	1.5 J	ND	0.31 NJ	0.4 NJ	0.025 NJ	4.0 J
Acenaphthene	ppm	ND	ND	2.8 J	0.012 NJ	ND	ND	0.68 J	ND	1.3 J	ND	0.17 NJ	0.24 NJ	0.061 J	4.7 J
Dibenzofuran	ppm	ND	0.008 NJ	1.8 J	0.006 NJ	ND	ND	0.52 NJ	ND	0.99 J	ND	0.13 NJ	0.2 NJ	0.008 NJ	3.4 J
Fluorene	ppm	ND	ND	2.6 J	ND	ND	ND	0.66 J	ND	1.3 J	ND	0.16 NJ	0.24 NJ	0.009 NJ	4.1 J
Phenanthrene	ppm	0.004 NJ	0.014 NJ	6.5 J	0.030 J	0.007 NJ	0.02 J	2 J	0.007 NJ	3.9 J	0.012 NJ	0.59 J	0.82 J	0.019 J	12
Anthracene	ppm	0.018 NJ	ND	2.2 J	0.007 NJ	ND	ND	0.41 NJ	0.006 NJ	0.85 J	0.15 J	0.11 NJ	0.15 NJ	0.006 NJ	2.3 J
Carbazole	ppm	*ND*	*ND*	*0.52 NJ*	*0.006 NJ*	*ND*	*ND*	*0.30 NJ*	*ND*	*0.42 J*	*ND*	*ND*	*ND*	*0.005 NJ*	*1.7 J*
Fluoranthene	ppm	ND	0.009 J	2.6 J	0.027 J	ND	ND	1.1 J	ND	1.7 J	0.11 J	0.28 NJ	0.42 NJ	0.013 NJ	6.0 J
Pyrene	ppm	0.017 NJ	ND	2 J	0.022 NJ	ND	ND	0.79 J	0.005 NJ	1.2 J	0.13 J	0.28 NJ	0.32 NJ	0.011 NJ	4.5 J
Benzo(a)anthracene	ppm	ND	ND	0.44 NJ	ND	ND	ND	0.29 NJ	ND	0.42 NJ	0.03 J	ND	ND	ND	1.3 J
Chrysene	ppm	ND	ND	0.38 NJ	0.009 NJ	ND	ND	0.30 NJ	ND	0.49 J	0.051 J	ND	ND	0.005 NJ	1.4 J
bis(2-Ethylhexyl)phthalate	ppm	0.27 B	0.052 B	ND	ND	ND	ND	ND	ND	1 B	0.20 B	ND	ND	0.046 B	ND
Benzo(b)fluoranthene	ppm	ND	ND	0.30 NJ	0.009 NJ	ND	ND	0.36 NJ	ND	0.33 NJ	0.047 J	ND	ND	ND	1.1 J
Benzo(k)fluoranthene	ppm	ND	ND	0.12 NJ	ND	ND	ND	0.15 NJ	ND	0.12 NJ	0.019 J	ND	ND	ND	0.44 NJ
Benzo(a)pyrene	ppm	ND	0.008 J	ND	0.007 NJ	ND	ND	0.18 NJ	ND	0.19 NJ	0.006 NJ	ND	ND	ND	0.78 J
Indeno(1,2,3-cd)pyrene	ppm	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*0.016 NJ*	*ND*	*ND*	*ND*	*0.36 NJ*
Benzo(g,h,i)perylene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.010 NJ	ND	ND	ND	0.27 NJ
Total Confident Conc BNAs	ppm	0.15	0.21	24.45	1.701	0.109	0.062	10.84	0.052	18.09	0.663	3.92	4.19	0.308	55.23
Tentatively Identified Compounds															
Unknown Aldol Condensate	ppm	140.00 R	8.6 R	120 R	116.03 R	170 JAB	140 JAB	190 JAB	163.47 JAB	170 R	123.38 R	200 R	170 R	144.3 JAB	150 R
Unknown Aldol Condensate	ppm	ND	1.9 R	ND	1.27 J	2.5 JA	0.6 JA	ND	3.47 JA	ND	ND	ND	ND	0.34 JA	ND
Unknown Alkanes	ppm	28.10 J	3 J	635 J	ND	0.13 J	2.72 J	66 J	0.32 J	144 J	12.62 J	114 J	252 J	1.03 J	1411 J
Unknowns	ppm	66.80 J	38.7 J	742 J	21.24 J	2.54 J	4.56 J	602 J	2.62 J	1201 J	5.6 J	1406 J	1236 J	4.64 J	5129 J
Benzoic Acid	ppm	*ND*	*0.66 NJ*	*ND*	*ND*	*0.27 NJ*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
1,3-Propanedione, 1,3-di	ppm	ND	ND	ND	1.6 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzaldehyde	ppm	ND	ND	ND	1.1 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dodecanamide, N,N-bis	ppm	ND	ND	ND	3.3 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2 Thiazolidinethione	ppm	ND	ND	ND	0.51 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown Cycloalkane	ppm	ND	ND	ND	13.9 J	ND	ND	ND	ND	ND	0.99 J	ND	ND	0.42 J	ND
Acetophenone	ppm	ND	ND	ND	ND	0.58 R	ND	ND	0.13 R	ND	ND	ND	ND	ND	ND
2-Cyclohexene-1-one	ppm	ND	ND	ND	ND	0.14 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown Organic Acids	ppm	ND	ND	ND	ND	ND	ND	41 J	ND	ND	ND	ND	ND	5.4 J	ND
1 Docosanol	ppm	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*340 NJ*	*ND*	*150 NJ*	*ND*	*ND*	*ND*
1,2,4-Trithiolane	ppm	ND	ND	ND	ND	ND	ND	ND	ND	27 NJ	ND	46 NJ	37 NJ	ND	33 NJ
Camphene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	28 NJ	ND	ND	ND	ND	ND
Octyl	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.63 J	ND
Total TICs	ppm	94.90	42.16	1377	42.92	5.58	7.86	709	6.41	1740	19.21	1192.60	1525	14.46	487
ICL PESTICIDES/PCBs															
Heptachlor	ppm	ND	ND	ND	ND	ND	ND	ND	ND	0.0042 KJ	ND	ND	ND	ND	ND
Aldrin	ppm	ND	ND	ND	ND	ND	ND	0.0074 KJ	ND	0.022 KJ	ND	ND	ND	ND	ND
Heptachlorepoxide	ppm	ND	ND	0.037 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ppm	ND	ND	0.055 R	ND	ND	ND	0.0035 KJ	ND	ND	ND	0.0032 R	0.0028 R	ND	ND
Endosulfanl	ppm	ND	ND	ND	ND	ND	ND	0.012 KJ	ND	ND	ND	0.026 J	0.019 J	ND	ND
4,4-DDT	ppm	ND	ND	0.0023 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0059 J
alpha-Chlordane	ppm	ND	ND	ND	ND	ND	ND	0.0059 KJ	ND	0.0086 KJ	ND	ND	ND	ND	0.0093 J
gamma-Chlordane	ppm	0.0021 J	ND	ND	ND	ND	ND	0.0028 KJ	ND	0.0094 KJ	ND	0.0071 J	0.0063 J	ND	0.0034 J
METALS															
Aluminum	ppm	1980 J	16700 J	2340 J	7920 J	4320 J	4280 J	3340 J	5100 J	4100 J	4040 J	20400 J	21200 J	18500 J	6580 J
Antimony	ppm	ND	1.3 L	ND	ND	ND	ND	7.9 L	ND	1.5 L	ND	1.9 L	1.7 L	ND	3.3 L
Arsenic	ppm	4.4 K	5.0 K	23.2	11.0	3.9	14.4	224	9.8	262	3.9 K	10.2	14.7	7.1	134
Barium	ppm	11.0	73.7	13.5	28.8	12.0	14.6	147	15.0	33.5	22.0	125	123	56.1	791
Beryllium	ppm	0.09 J	0.73	0.10 J	0.40	0.17	0.13 J	0.30	0.17	0.22	0.14	1.2	1.2	0.62	0.35
Cadmium	ppm	ND	ND	ND	ND	ND	ND	0.88	ND	6.1	ND	ND	ND	ND	0.76
Calcium	ppm	143 B	770	119 B	947 B	141 B	141 B	230 B	150 B	334 B	155 B	905	948	291 B	343 B
Chromium	ppm	3.8	39.0	4.3	13.7	5.2	6.5	16.2	7.2	10.2	6.9	48.9	47.2	26.0	12.9
Cobalt	ppm	0.34	8.7	3.3	8.0	1.1	2.3	33.9	1.6	28.3	1.2	12.7	11.8	6.6	8.8
Copper	ppm	1.8	7.4	7.8	7.4	4.2	12.5	753	8.2	90.8	7.2	11.7	10.4	11.5	229
Iron	ppm	2090	16300	2340	8710	4780	4230	20600	4680	6290	3780	26300	23400	22200	10000
Lead	ppm	1.4 B	9.8	5.4 B	7.0 B	4.2 JB	13.4 J	654	8.3	184	6.1 B	14.4	12.2	11.6	332
Magnesium	ppm	114	4950	140	1240	204	234	194	297	523	373	5080	4530	2070	723
Manganese	ppm	5.2	165	6.2	48.6	16.7	13.5	36.3	16.6	34.0	14.7	215	186	158	62.5
Mercury	ppm	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND	0.04	0.35
Nickel	ppm	1.2	18.3	2.7 L	9.5	2.3	2.9	9.8	3.4	10.3	3.0	23.7	22.8	12.2	7.1
Potassium	ppm	ND	1530	ND	625	43.1 L	76.6 L	37.9 L	118 L	201 L	90.9 L	1480	1560	866	210
Selenium	ppm	ND	ND	ND	ND	ND	ND	2.2	ND	1.4 B	ND	0.85 B	1.1 B	1.1 B	1.0 B
Silver	ppm	ND	ND	ND	ND	ND	0.25 J	2.9	0.26 J	0.73 J	0.23 J	ND	ND	ND	0.76
Sodium	ppm	ND	2780	ND	1900	ND	ND	1600	ND	605 L	ND	3480	3400	443 L	389 L
Thallium	ppm	ND	1.8 B	1.2 B	1.2 B	ND	ND	ND	ND	1.2 B	ND	2.1 B	3.5 B	1.9 B	ND
Vanadium	ppm	4.7	35.6	7.2	20.4	8.8	10.5	16.7	11.7	20.0	11.8	48.9	51.3	36.8	22.1
Zinc	ppm	4.7 B	623	31.8	469	8.8	17.2	382	15.9	870	9.4	67.9	85.9	49.9	187
Cyanide	ppm	ND	ND	ND	ND	ND	ND	5.1	ND	ND	ND	1.5	ND	ND	4.8

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals
J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
A (TICs) - Indicates that a TIC is a suspected aldol-condensation product
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals
ND - Compound not detected.
Note: Soil samples analyzed for volatile compounds were not preserved

20616\WM1ST.XLS

ORIGINAL (Red)

TABLE 1
SUMMARY OF SOIL ANALYTICAL DATA - WATER MAIN (FIRST INVESTIGATION)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:			048	049	050	051	052	062 (DUP-1)	053	054	055	056	057	063 (DUP-2)	058	059
Sample Location:		RCRA	TP-1	TP-1	TP-2	TP-2	TP-3	TP-3	TP-3	TP-4	TP-4	TP-5	TP-5	TP-5	TP-6	TP-6
Lab Sample Number:		Toxicity	29868	29869	29870	29871	29872	29882	29873	29874	29875	29876	29877	29883	29878	29879
Sampling Date:		Reg.	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95
Depth (feet):		Levels	0.75-1.25	5.5-6.0	1.5-2.0	5.0-5.5	1.5-2.0	1.5-2.0	5.5-6.0	1.5-2.0	5.5-6.0	1.5-2.0	5.5-6.0	5.5-6.0	2.5-3.0	5.5-6.0
PARAMETERS	Units															
WET CHEMISTRY TESTS																
Ignitability	deg F	=>140	>160	>160	>160	>160	>160	>160	>160	>160	>160	>160	>160	>160	>160	>160
Corrosivity	std	2=<12.5	5.76	5.40	5.77	5.77	6.59	6.61	6.49	6.41	6.19	5.07	5.17	5.49	5.55	6.38
Reactive Sulfide	ppm	-	ND	ND	56	56	ND	ND	99	ND	28	ND	ND	ND	ND	110
Reactive Cyanide	ppm	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Free Cyanide	ppm	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiocyanate	ppm	-	ND	1540	2080	2080	6.0 J	18.4 J	1850	19.3	548	ND	2710	2600	27.6	430

J - Analyte present. Reported value may not be accurate or precise.
ND - Compound not detected.

20616\WM1ST.XLS

TABLE 1
SUMMARY OF SOIL ANALYTICAL DATA - WATER MAIN (FIRST INVESTIGATION)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:			Comp 001	Comp 002	Comp 003	Comp 004	Comp 005	Comp 006
Sample Location:		RCRA	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6
Lab Sample Number:		Toxicity	29885	29886	29887	29888	29889	29890
Sampling Date:		Reg.	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95	8/29/95
Depth (feet):		Levels	n/a	n/a	n/a	n/a	n/a	n/a
PARAMETERS	Units							
TCLP VOLATILE COMPOUNDS								
Trichloroethene	ppm	-	ND	ND	ND	ND	0.008 J	0.084
Total Confident Conc. VOAs	ppm	-	ND	ND	ND	ND	0.008	0.084
TCLP EXTRACTABLE ORGANICS *								
Total Confident Conc. BNAs	ppm	-	ND	ND	ND	ND	ND	ND
TCLP PESTICIDES	ppm	-	ND	ND	ND	ND	ND	ND
TCLP HERBICIDES	ppm	-	ND	ND	ND	ND	ND	ND
TCLP METALS								
Arsenic	ppm	5	0.02	0.19	0.44	2.0	0.02	0.42
Barium	ppm	100	0.32	0.55	0.72	0.54	0.49	0.67
Lead	ppm	5	ND	ND	1.4	0.5	ND	1.1

J - Analyte present. Reported value may not be accurate or precise.
ND - Compound not detected.
Comp 001 - Composite sample.

20616\WM1ST.XLS

TABLE 2
SUMMARY OF SOIL ANALYTICAL DATA - WATER MAIN (SECOND INVESTIGATION)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:		067	069	068	070	071	104	099	105 (DUP-4)
Sample Location:		TP-28	TP-28	TP-28	TP-29	TP-29	TP-30	TP-30	TP-30
Lab Sample Number:		36169	36171	36170	36172	36173	36401	36396	36402
Sampling Date:		12/11/95	12/11/95	12/11/95	12/11/95	12/11/95	12/13/95	12/13/95	12/13/95
Depth (feet):		1.7-2.2	5.0-5.5	6.5-7.0	3.0-3.5	3.5-4.0	1.1-1.6	3.5-4.0	3.5-4.0
PARAMETERS	Units								
VOLATILE COMPOUNDS *									
CarbonDisulfide	ppm	ND	ND	ND	ND	ND	0.095 J	ND	ND
Total Confident Conc. VOAs	ppm	ND	ND	ND	ND	ND	0.095	ND	ND
Tentatively Identified Compounds (TICs)									
Unknown Siloxanes	ppm	ND	ND	0.39 R	0.31 R	ND	ND	ND	ND
Unknown Alcohols	ppm	ND	ND	ND	ND	ND	ND	ND	ND
Total TICs	ppm	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILE COMPOUNDS									
Phenol	ppm	ND	0.17 J	0.02 J	0.042 J	ND	ND	ND	ND
4-Methylphenol	ppm	ND	ND	0.006 NJ	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ppm	ND	0.011 NJ	ND	ND	ND	ND	ND	ND
Naphthalene	ppm	ND	0.5 J	0.009 NJ	0.27 J	0.005 NJ	0.007 NJ	0.089 J	0.31 J
2-Methylnaphthalene	ppm	ND	0.61 J	ND	0.43 J	ND	0.006 NJ	0.12 J	0.26 J
Acenaphthene	ppm	ND	0.19 J	ND	0.031 J	ND	ND	0.079 J	0.52 J
Dibenzofuran	ppm	ND	0.2 J	ND	0.17 J	ND	ND	0.09 J	0.5 J
Fluorene	ppm	ND	0.13 J	ND	ND	ND	ND	0.091 J	0.64 J
Hexachlorobenzene	ppm	ND	ND	ND	0.032 J	ND	ND	ND	ND
Phenanthrene	ppm	ND	0.55	0.018 NJ	0.57 J	0.006 J	0.007 NJ	0.2 J	1.9 J
Anthracene	ppm	ND	0.11 J	ND	0.037 J	ND	ND	0.057 J	0.41 J
Carbazole	ppm	ND	0.062 J	ND	0.028 J	ND	ND	0.084 J	0.34 J
Fluoranthene	ppm	ND	0.47	0.04 J	0.26 J	ND	0.012 J	0.15 J	1.3 J
Pyrene	ppm	ND	0.37 J	0.03 J	0.18 J	ND	0.01 J	0.099 J	0.9 J
Benzo(a)anthracene	ppm	ND	0.22 J	0.026 J	0.11 J	ND	ND	0.037 J	0.5 J
Chrysene	ppm	ND	0.31 J	0.026 J	0.22 J	ND	0.01 J	0.05 J	0.66 J
bis(2-Ethylhexyl)phthalate	ppm	0.16 B	0.057 B	0.071 B	0.089 J	0.067 B	0.053 B	ND	ND
Benzo(b)fluoranthene	ppm	ND	0.31 J	0.036 J	0.18 J	ND	0.018 J	0.034 J	0.5 J
Benzo(k)fluoranthene	ppm	ND	0.1 J	0.014 NJ	0.044 J	ND	0.005 NJ	0.016 NJ	0.19 J
Benzo(a)pyrene	ppm	ND	0.16 J	0.025 J	0.07 J	ND	0.008 NJ	0.018 NJ	0.3 J
Indeno(1,2,3-cd)pyrene	ppm	ND	0.084 J	0.015 NJ	0.036 J	ND	0.007 NJ	ND	0.16 J
Dibenz(a,h)anthracene	ppm	ND	0.007 NJ	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ppm	ND	0.078 J	0.011 NJ	0.043 J	ND	0.006 NJ	ND	0.14 J
Total Confident Conc. BNAs	ppm	ND	4.642	0.275	2.842	0.011	0.096	1.214	9.53
Tentatively Identified Compounds									
Unknown Aldol Condensate	ppm	ND	ND	ND	ND	0.61 AJ	1.16 R	1.14 JAB	ND
Unknown Alcohols	ppm	0.17 J	0.77 J	ND	0.62 J	ND	ND	0.79 J	4 J
Unknown Organic Acids	ppm	ND	ND	ND	0.7 J	0.14 J	ND	ND	ND
C6H12 Hydrocarbons	ppm	ND	ND	ND	ND	ND	ND	ND	1.8 J
Unknown Thioglycolate	ppm	ND	ND	ND	ND	ND	ND	0.83 J	ND
Octyl Thioglycolate	ppm	ND	ND	ND	ND	ND	ND	1.3 NJ	ND
Cyclotetradecane	ppm	ND	ND	ND	ND	ND	ND	0.21 NJ	ND
D-Friedooleon-14-ENE	ppm	ND	ND	ND	ND	ND	ND	0.98 NJ	ND
Dodecanoic Acid	ppm	ND	ND	1.4 R	ND	0.6 R	ND	3 NJ	ND
Cyclohexadecane	ppm	ND	ND	0.27 NJ	ND	ND	ND	ND	ND
Oleic Acid	ppm	ND	ND	0.45 NJ	ND	ND	ND	ND	ND
Octadecanoic Acid	ppm	ND	ND	0.34 NJ	ND	ND	ND	ND	ND
Hexadecanoic Acid	ppm	ND	ND	1.2 NJ	ND	ND	ND	ND	ND
.Gamma.-Sitosterol	ppm	ND	ND	0.65 NJ	ND	ND	ND	ND	ND
Benzaldehyde	ppm	ND	0.58 NJ	ND	ND	ND	ND	ND	ND
Napthalene, 1-Methyl	ppm	ND	0.35 NJ	ND	0.34 NJ	ND	ND	ND	ND
Dimethyl Napthalene	ppm	ND	0.97 J	ND	0.27 J	ND	ND	ND	ND
Trimethyl Napthalene	ppm	ND	0.54 J	ND	0.31 J	ND	ND	ND	ND
C15H12 PAHs	ppm	ND	1.01 J	ND	1.28 J	ND	ND	ND	0.86 J
C16H14 PAHs	ppm	ND	0.4 J	ND	0.94 J	ND	ND	ND	1 J
C17H12 PAHs	ppm	ND	0.3 J	ND	ND	ND	ND	ND	ND
C19H14 PAHs	ppm	ND	ND	ND	0.22 J	ND	ND	ND	ND
Dimethyl Benzene Isomer	ppm	ND	ND	ND	0.34 J	ND	ND	ND	ND
7H-Bebz(De) Anthracene	ppm	ND	0.14 NJ	ND	0.22 NJ	ND	ND	ND	ND
Benzo(B) Napthothiophene	ppm	ND	ND	ND	0.3 J	ND	ND	ND	ND
Cyclopentasiloxane, Dec	ppm	ND	ND	ND	ND	0.082 R	ND	ND	ND
Benzoic Acid	ppm	ND	ND	ND	0.34 NJ	ND	ND	ND	ND
Unknown	ppm	ND	2.43 J	11.45 J	5.16 J	2.262 J	ND	17.19 J	42.8 J
Total TICs	ppm	0.17	7.49	14.36	11.04	3.012	ND	24.3	50.46
TCL PESTICIDES/PCBs									
delta-BHC	ppm	ND	ND	ND	5.4 JK	ND	ND	ND	ND
METALS									
Aluminum	ppm	4470	3000	17300	1000	9520	4840	3830	5340
Antimony	ppm	ND	ND	ND	13.3 L	ND	ND	ND	ND
Arsenic	ppm	2.4 B	48.8	8.0	92.9	3.6	3.1	20.0	12.0
Barium	ppm	19.2	54.6	80.9	289	54.2	20.0	34.8	30.2
Beryllium	ppm	0.40	0.28	0.96	0.13	0.48	0.20	0.13	0.16
Cadmium	ppm	ND	0.35 B	0.79	0.36 B	ND	ND	ND	ND
Calcium	ppm	93.3	253	940	321	269	87.5	289	242
Chromium	ppm	6.8	10.3	39.4	7.9	13.7	7.1	8.9	10.6
Cobalt	ppm	2.3	13.2	14.9	4.7	2.8	1.5	10	8.1
Copper	ppm	1.8 J	430 J	2200 J	353 J	38.6 J	7.7	32.6 J	7.0 J
Iron	ppm	11500	19900	21300	6070	13000	7130	8800	6850
Lead	ppm	3.9	146	28.0	1450	10.7	13.6	14.2	7.6
Magnesium	ppm	237	225	5010	287	1280	466	402	450
Manganese	ppm	50.7	34.8	178	12.1	84.0	44.8	22.9	20.0
Mercury	ppm	ND	0.08	0.08	0.19	ND	ND	0.07 J	0.07 J
Nickel	ppm	4.7	7.9	21.3	6.4	7.6	3.5	4.0	4.5
Potassium	ppm	ND	ND	1270	ND	405	194	210	293
Selenium	ppm	ND	1.0 L	ND	1.8 L	ND	0.81 B	ND	ND
Silver	ppm	ND	0.30 J	ND	2.0	ND	ND	0.66 L	ND
Sodium	ppm	144 B	296 B	461 B	338 B	317 B	86.4 B	116 B	128 B
Thallium	ppm	ND	ND	ND	1.9 J	ND	ND	ND	ND
Vanadium	ppm	14.1	11.1 B	35.9	10.9	21.2	12.0	9.4 L	10.3
Zinc	ppm	15.3	1000	1950	170	27.6	13.4	68.1	16.1 J
Cyanide	ppm	ND	ND	ND	ND	ND	ND	0.98	0.83

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.
J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
A (TICs) - Indicates that a TIC is a suspected aldol-condensation product
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.

TABLE 2
SUMMARY OF SOIL ANALYTICAL DATA - WATER MAIN (SECOND INVESTIGATION)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:		100	101	103	075	074	076	077	078 (DUP-3)
Sample Location:		TP-31	TP-31	TP-31	TP-32	TP-32	TP-33	TP-33	TP-33
Lab Sample Number:		36397	36398	36400	36177	36176	36178	36179	36185
Sampling Date:		12/13/95	12/13/95	12/13/95	12/11/95	12/11/95	12/11/95	12/11/95	12/11/95
Depth (feet):		0.8-1.3	3.0-3.5	5.5-6.0	3.0-3.5	8.0-8.5	3.0-3.5	6.0-6.5	6.0-6.5
PARAMETERS	Units								
VOLATILE COMPOUNDS									
CarbonDisulfide	ppm	ND	5300	3900	ND	ND	ND	ND	ND
Total Confident Conc. VOAs	ppm	ND	5300	3900	ND	ND	ND	ND	ND
Tentatively Identified Compounds (TICs)									
Unknown Siloxanes	ppm	ND	ND	ND	ND	ND	ND	0.16 R	0.26 R
Unknown Alcohols	ppm	ND	ND	ND	ND	ND	ND	1.84 J	ND
Total TICs	ppm	ND	ND	ND	ND	ND	ND	1.84	ND
SEMIVOLATILE COMPOUNDS									
Phenol	ppm	ND	ND	ND	ND	0.024 J	ND	0.068 J	0.063 J
4-Methylphenol	ppm	ND	ND	0.24 NJ	ND	ND	ND	ND	ND
Naphthalene	ppm	ND	7.9 J	1.1 J	0.005 NJ	0.004 NJ	0.02 J	0.015 J	0.017 J
2-Methylnaphthalene	ppm	ND	3.4 J	0.63 J	ND	ND	0.022 J	0.052 J	0.048 J
Acenaphthylene	ppm	ND	ND	ND	0.018 J	ND	ND	ND	ND
Acenaphthene	ppm	ND	3.5 J	0.61 J	ND	ND	ND	ND	ND
Dibenzofuran	ppm	ND	1.6 NJ	0.46 J	ND	ND	ND	0.03 J	0.021 J
Fluorene	ppm	ND	2.7 NJ	0.62 J	ND	ND	ND	0.017 J	0.014 NJ
Phenanthrene	ppm	ND	5.8 J	1.5 J	ND	0.006 NJ	0.028 J	0.02 J	0.011 NJ
Anthracene	ppm	ND	0.84 NJ	0.3 NJ	0.01 J	ND	ND	0.01 NJ	0.008 NJ
Carbazole	ppm	ND	1.1 NJ	0.23 NJ	ND	ND	ND	0.009 NJ	0.007 NJ
Fluoranthene	ppm	ND	2.7 NJ	0.53 J	0.025 J	ND	0.025 J	0.02 J	0.011 NJ
Pyrene	ppm	ND	1.9 J	0.34 NJ	0.06 J	ND	0.019 J	0.015 J	0.009 NJ
Benzo(a)anthracene	ppm	ND	ND	ND	0.083 J	ND	0.014 NJ	0.011 NJ	0.006 NJ
Chrysene	ppm	ND	0.86 NJ	ND	0.073 J	ND	0.023 J	0.018 J	0.011 NJ
bis(2-Ethylhexyl)phthalate	ppm	ND	ND	ND	0.049 J	ND	0.049 J	ND	ND
Benzo(b)fluoranthene	ppm	ND	ND	ND	0.14 J	ND	0.02 J	ND	0.008 NJ
Benzo(k)fluoranthene	ppm	ND	ND	ND	0.063 J	ND	0.008 NJ	ND	ND
Benzo(a)pyrene	ppm	ND	ND	ND	0.087 J	ND	0.012 NJ	ND	ND
Indeno(1,2,3-cd)pyrene	ppm	ND	ND	ND	0.045 J	ND	0.008 NJ	ND	ND
Dibenz(a,h)anthracene	ppm	ND	ND	ND	0.004 NJ	ND	ND	ND	ND
Benzo(g,h,i)perylene	ppm	ND	ND	ND	0.036 J	ND	0.008 NJ	ND	ND
Total Confident Conc. BNAs	ppm	ND	32.3	6.56	0.698	0.034	0.256	0.285	0.234
Tentatively Identified Compounds									
Unknown Aldol Condensate	ppm	0.29 R	ND	ND	ND	0.14 R	0.24 R	ND	ND
Unknown Alcohols	ppm	ND	867 J	724 J	ND	ND	ND	ND	ND
Unknown Alkenes	ppm	ND	33 J	ND	ND	ND	ND	ND	ND
Unknown Organic Acids	ppm	ND	ND	ND	0.09 J	0.9 J	0.11 J	0.087 J	ND
C6H12 Hydrocarbons	ppm	ND	320 J	170 J	ND	ND	ND	ND	ND
Octyl Thioglycolate	ppm	ND	110 NJ	21 J	ND	ND	ND	ND	ND
Benzaldehyde	ppm	ND	ND	ND	ND	0.13 NJ	ND	ND	ND
Cyclopentasiloxane, Dec	ppm	ND	ND	ND	ND	0.13 R	ND	ND	ND
Acetophenone	ppm	ND	ND	ND	ND	0.22 R	ND	ND	ND
Dimethyl Tetrasulphide	ppm	ND	ND	ND	ND	ND	ND	0.084 NJ	0.23 NJ
2-Phenyl Propenal	ppm	ND	ND	ND	ND	ND	ND	ND	0.084 NJ
1-Octanol	ppm	ND	490 NJ	ND	ND	ND	ND	ND	ND
2,4,4-Trimethyl-1-Pentanol	ppm	ND	29 NJ	ND	ND	ND	ND	ND	ND
Unknown	ppm	1.91 J	251 J	329.8 J	0.243 J	2.918 J	0.268 JB	1.1 J	2.198 J
Total TICs	ppm	1.91	2100	1244.8	0.333	3.948	0.378	1.271	2.512
TCL PESTICIDES/PCBs									
gamma-BHC(Lindane)	ppm	ND	0.0036 JK	ND	ND	ND	ND	ND	ND
4,4'-DDD	ppm	ND	0.022 JK	ND	ND	ND	ND	ND	ND
alpha-Chlordane	ppm	ND	0.0084 JK	ND	ND	ND	ND	ND	ND
gamma-Chlordane	ppm	ND	ND	0.0026 J	ND	ND	ND	ND	ND
Aroclor-1254	ppm	ND	064 JK	0.17	ND	ND	ND	ND	ND
Aroclor-1260	ppm	ND	0.49 JK	0.11 J	ND	ND	ND	ND	ND
METALS									
Aluminum	ppm	3300	7520	9640	6530	3490	9700	7940	9400
Antimony	ppm	ND	17.6 L	ND	ND	ND	ND	ND	ND
Arsenic	ppm	4.1	1560	38.9	2.7	22.9	12.9	46.3	40.3
Barium	ppm	17.7	537	73.9	29.1	28.5	73.8	60.1	49.2
Beryllium	ppm	0.10	0.44	0.74	0.29	0.26	0.51	0.45	0.46
Cadmium	ppm	ND	9.4	ND	ND	ND	0.22	ND	ND
Calcium	ppm	140	683	435	73.3 B	168	907	752	718
Chromium	ppm	3.4	62.0	20.9	12.1	6.9	18.8	18.4	19.7
Cobalt	ppm	0.34 J	139	17.5	4.3	4.0	10.6	7.4	8.2
Copper	ppm	5.5	4640	39.8	7.1 J	14.8 J	58.2 J	93.9 J	57.4 J
Iron	ppm	4200	98700	18400	12700	8370	19700	18400	18100
Lead	ppm	5.3	3590	36.9	3.5	2.8	89.3	46.4	27.7
Magnesium	ppm	171	1900	2170	1640	1280	2150	2190	2110
Manganese	ppm	12.5	200	113	142	89.9	360	165	166
Mercury	ppm	ND	0.19	0.07 J	ND	ND	0.09	0.07	ND
Nickel	ppm	1.8	43.8	13.3	7.8	7.2	11.5	10	10.6
Potassium	ppm	140	807	972 J	1040	799	1220	1050	1030
Selenium	ppm	ND	2.1 L	0.88 B	ND	ND	ND	0.97 L	ND
Silver	ppm	ND	18.6	ND	ND	ND	ND	ND	ND
Sodium	ppm	120 B	2280	1570	135 B	190 B	322 B	375 B	373 B
Thallium	ppm	ND	4.4 L	ND	ND	ND	ND	ND	ND
Vanadium	ppm	7.9	113	30.0	22.4	11.2	28.4	27.1	31.0
Zinc	ppm	5.2 B	1140	752	23.3	50.8	70.7	52.0	43.6
Cyanide	ppm	ND	14.8	ND	ND	ND	ND	ND	ND

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.
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L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
A (TICs) - Indicates that a TIC is a suspected aldol-condensation product.
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.

ORIGINAL
(Red)

AR306045

TABLE 2
SUMMARY OF SOIL ANALYTICAL DATA - WATER MAIN (SECOND INVESTIGATION)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:			067	069	068	070	071	104	099	105 (DUP-4)	100	101	103	075	074	076	077	078 (DUP-3)
Sample Location:		RCRA	TP-28	TP-28	TP-28	TP-29	TP-29	TP-30	TP-30	TP-30	TP-31	TP-31	TP-31	TP-32	TP-32	TP-33	TP-33	TP-33
Lab Sample Number:		Toxicity	36169	36171	36170	36172	36173	36401	36396	36402	36397	36398	36400	36177	36176	36178	36179	36185
Sampling Date:		Reg.	12/11/95	12/11/95	12/11/95	12/11/95	12/11/95	12/13/95	12/13/95	12/13/95	12/13/95	12/13/95	12/13/95	12/11/95	12/11/95	12/11/95	12/11/95	12/11/95
Depth (feet):		Levels	1.7-2.2	5.0-5.5	6.5-7.0	3.0-3.5	3.5-4.0	1.1-1.6	3.5-4.0	3.5-4.0	0.8-1.3	3.0-3.5	5.5-6.0	3.0-3.5	8.0-8.5	3.0-3.5	6.0-6.5	6.0-6.5
PARAMETERS	Units																	
TCLP VOLATILE COMPOUNDS																		
Total Confident Conc. VOAs	ppm	-	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA
TCLP EXTRACTABLE ORGANICS *																		
Total Confident Conc. BNAs	ppm	-	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA
TCLP PESTICIDES	ppm	-	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA
TCLP HERBICIDES	ppm	-	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA
TCLP METALS																		
Arsenic	ppm	5	NA	0.23 K	NA	ND	NA	NA	ND	NA	NA	0.73 L	NA	ND	NA	ND	NA	NA
Barium	ppm	100	NA	9.4 N	NA	11.9 N	NA	NA	0.43	NA	NA	0.51	NA	12.6 N	NA	7.3 N	NA	NA
Lead	ppm	5	NA	ND	NA	6.6	NA	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA
WET CHEMISTRY TESTS																		
Ignitability	deg F	=>140	>160	>160	>160	>160	>160	>160	>160	NA	>160	>160	>160	>160	>160	>160	>160	>160
Corrosivity	std	2=<12.5	4.28	6.19	5.20	6.64	6.33	4.79	6.82	NA	6.02	7.65	5.29	4.03	8.38	7.32	7.25	7.34
Reactive Sulfide	ppm	-	ND	ND	ND	ND	ND	ND	117	NA	ND	556	ND	ND	57.7	ND	ND	69.7
Reactive Cyanide	ppm	-	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	ppm	-	454	50000	16300	260000	5620	2460	5740 R	23900 R	1460	103000	38100	564	176	2220	1070	2700
Free Cyanide	ppm	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiocyanate	ppm	-	ND	46.1	107	13.8	12.8	ND	ND R	12.2 R	ND	418	872	ND	10.2	10.7	6.4	6.5

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.
NA - Compound not analyzed.

TABLE 3

SUMMARY OF GROUNDWATER ANALYTICAL DATA

WATER MAIN (SECOND INVESTIGATION)

HALBY CHEMICAL SUPERFUND SITE

WILMINGTON, DELAWARE

Sample ID:		102	
Sample Location:		TP-31	
Lab Sample Number:		36399	
Sampling Date:		12/13/95	
PARAMETERS	Units		
VOLATILE COMPOUNDS *			
CarbonDisulfide	ppb	1500000	
Total Confident Conc. VOAs	ppb	1500000	
TENTATIVELY IDENTIFIED COMPOUNDS (TICs)	ppb	ND	
SEMIVOLATILE COMPOUNDS			
Napthalene	ppb	350	
Phenanthrene	ppb	140	
Total Confident Conc. BNAs	ppb	490	
TENTATIVELY IDENTIFIED COMPOUNDS			
Unknown Alcohols	ppb	48100	J
Unknown Cycloalkanes	ppb	32100	J
Unknown Organic Acids	ppb	45200	J
Unknown Alkanes	ppb	4920	J
Unknown Alkenes	ppb	23800	J
Unknowns	ppb	35480	J
Total TICs	ppb	189600	J
TCL PESTICIDES/PCBs	ppb	ND	
METALS			
Aluminum	ppb	29600	
Antimony	ppb	11.9	L
Arsenic	ppb	3840	
Barium	ppb	974	
Beryllium	ppb	1.0	
Cadmium	ppb	1.0	
Calcium	ppb	10500	
Chromium	ppb	165	
Cobalt	ppb	114	
Copper	ppb	4810	
Iron	ppb	126000	
Lead	ppb	2330	
Magnesium	ppb	11100	
Manganese	ppb	2910	
Mercury	ppb	3.6	
Nickel	ppb	65.6	
Potassium	ppb	17200	
Selenium	ppb	5.8	B
Silver	ppb	7.2	B
Sodium	ppb	897000	
Thallium	ppb	ND	
Vanadium	ppb	113	
Zinc	ppb	790	
WET CHEMISTRY TESTS			
Free Cyanide	ppm	NS	
Total Cyanide	ppm	0.05	
Thiocyanate	ppm	922	

* Values listed reflect the combined standards for the 'cis and trans' isomers of 1,3-Dichloropropene.

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

ND - Compound not detected.

NS - Insufficient sample volume.

TABLE 4
SUMMARY OF FIELD GC ANALYTICAL DATA
CARBON DISULFIDE CONCENTRATIONS IN ug/kg (ppb)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample Location:	TP-7	TP-8	TP-11	TP-13	TP-18	TP-21	TP-21	TP-23	TP-26	TP-34	TP-34	TP-35	TP-35	TP-36	TP-36
Sample Date:	12/14/95	12/14/95	12/14/95	12/14/95	12/14-12/15/95	12/15/95	12/15/95	12/18/95	12/14/95	12/14/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95
nple Depth (feet)							(dilution)				(MEOH)		(MEOH)		(MEOH)
2	5	102	2	ND	101	5,949	NA	17	11	ND	NA	ND	NA	ND	NA
4	22	487	679,593	59	4	18	NA	4,253	ND	ND	NA	NA	NA	NA	NA
6	14,934	5,153	NA	25,331	1,402,413	92,899	NA	122,461	NA	4,704	4,928	6,360	16,913 *	NA	NA
8	NA	NA	NA	395,653	988,489	1,047,834	NA	569,107	NA	1,828	2,826	1,310	1,689	470,959	393,639
10	NA	NA	NA	250,980	350,364	325,402	NA	NA	NA	4,136	5,352	2,010	2,914	963,279	1,100,577
12	NA	NA	NA	307,373	NA	1,405,525	12,993,091	NA	NA	NA	NA	NA	NA	NA	NA

- Compound not detected.
- Compound not analyzed.
)H - Methanol extraction.
Methanol dilution.
: Analyses performed by ERM of Exton, Pennsylvania.

TABLE 5

SUMMARY OF SOIL ANALYTICAL DATA - DRAINAGE DITCH

HALBY CHEMICAL SUPERFUND SITE

WILMINGTON, DELAWARE

Sample ID:		112	111	113	114	116	121 (DUP-5)	117	088	089	118	119	120	125
Sample Location:		TP-7	TP-7	TP-8	TP-8	TP-11	TP-11	TP-11	TP-12	TP-12	TP-13	TP-13	TP-18	TP-18
Lab Sample Number:		36528	36527	36529	36530	36532	36537	36533	36272	36273	36534	36535	36536	36647
Sampling Date:		12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/12/95	12/12/95	12/14/95	12/14/95	12/14/95	12/15/95
Depth (feet)		2.5-3.0	4.5-5.0	3.0-3.5	7.0-7.5	3.5-4.0	3.5-4.0	9.5-10.0	3.5-4.0	5.5-6.0	5.5-6.0	11.5-12.0	5.5-6.0	9.7-10.2
PARAMETERS	Units													
VOLATILE COMPOUNDS *														
MethyleneChloride	ppm	ND	ND	0.11 J	0.069 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
CarbonDisulfide	ppm	0.053 J	36	0.054 J	8.6	6700	5000	230	9.4	14	4300	3500	19000	2500 J
Benzene	ppm	ND	ND	0.39	0.73 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ppm	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ppm	ND	ND	0.17 J	0.68 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ppm	ND	ND	0.23 J	0.07 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ppm	ND	ND	1.6	0.44 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Confident Conc. VOAs	ppm	0.053	40	2.554	10.589	6700	5000	230	9.4	14	4300	3500	19000	2500
Tentatively Identified Compounds (TICs)														
Unknown Alcohol	ppm	ND	5.4 J	ND	4203 J	ND	ND	65 J	310 J	20 J	ND	ND	ND	ND
Unknown Siloxane	ppm	ND	2 R	ND	2.7 R	ND	ND	ND	5.5 R	0.64 R	640 R	ND	ND	230 R
Di-Isopropyl Ether	ppm	ND	ND	ND	ND	ND	ND	ND	ND	0.86 NJ	ND	ND	ND	ND
Unknown Alkane	ppm	ND	ND	0.69 J	ND	ND	ND	ND	3.7 J	ND	ND	ND	ND	ND
C7H14 Cycloalkane	ppm	ND	ND	0.53 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C8H18 Alkane	ppm	ND	ND	0.97 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C9H20 Alkane	ppm	ND	ND	0.57 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C12H22 Alkane	ppm	ND	ND	0.88 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknowns	ppm	ND	3.6 J	ND	12.62 J	ND	ND	ND	141.8 J	5.38 J	ND	ND	ND	ND
Total TIC's	ppm	ND	9	3.64	57.65	ND	ND	65	456.5	26.88	ND	ND	ND	ND
SEMIVOLATILE COMPOUNDS														
Phenol	ppm	ND	0.53 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	ppm	ND	0.57 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ppm	ND	1.6 J	0.095 NJ	ND	ND	ND	ND	1.6 J	ND	ND	ND	ND	ND
Naphthalene	ppm	0.06 NJ	1.2 J	1.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ppm	0.093 J	0.51 J	1.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ppm	0.027 NJ	0.046 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ppm	0.058 NJ	0.25 NJ	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ppm	0.076 NJ	0.2 NJ	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ppm	0.066 NJ	0.26 J	0.48 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ppm	0.59 J	1.2 J	1.8 J	ND	ND	ND	ND	1.3 J	ND	5 NJ	ND	ND	ND
Anthracene	ppm	0.047 NJ	0.18 J	0.39 J	ND	ND	ND	ND	0.24 NJ	ND	ND	ND	ND	ND
Carbazole	ppm	0.046 NJ	0.14 J	0.42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ppm	0.64 J	1.1 J	1.4 J	ND	ND	ND	ND	1.1 J	ND	ND	ND	ND	ND
Pyrene	ppm	0.59 J	1 J	1.2 J	ND	ND	ND	ND	0.82 J	ND	ND	ND	ND	ND
Benzo(a)anthracene	ppm	0.25 NJ	0.42 J	0.59 J	ND	ND	ND	ND	0.53 NJ	ND	ND	ND	ND	ND
Chrysene	ppm	0.35 J	0.52 J	0.66 J	ND	ND	ND	ND	0.47 NJ	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	ppm	1 B	0.86 J	0.47 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ppm	0.52 J	0.52 J	0.69 J	ND	ND	ND	ND	0.44 NJ	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ppm	0.18 J	0.2 J	0.28 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ppm	0.13 NJ	0.32 J	0.5 J	ND	ND	ND	ND	0.29 NJ	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ppm	0.24 NJ	0.18 J	0.27 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ppm	0.062 NJ	ND	0.074 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ppm	0.22 NJ	0.18 J	0.22 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Confident Conc. BNAs	ppm	4.265	11.986	13.039	ND	ND	ND	ND	6.79	ND	5	ND	ND	ND
Tentatively Identified Compounds														
Unknown Alcohol	ppm	4.9 J	45.3 J	3.22 J	305.90 J	3533 J	2760 J	13.6 J	2880 J	72.9 J	3864 J	390 J	5840 J	188.1 J
C6H12 Hydrocarbons	ppm	ND	24 J	ND	77 J	ND	700 J	9.4 J	ND	36 J	360 J	22 J	1200 J	5.7 J
Unknown Organic Acids	ppm	ND	119 J	ND	46 J	ND	ND	ND	ND	ND	ND	ND	180 J	ND
Octadecanoic Acid	ppm	ND	ND	ND	8.7 NJ	ND	ND	ND	ND	11 NJ	ND	ND	ND	ND
Octyl Thioglycolate	ppm	ND	22 NJ	4 NJ	45 NJ	690 NJ	830 NJ	6.5 NJ	ND	16 NJ	180 NJ	17 NJ	270 NJ	ND
Naphthalene, 1-Methyl	ppm	ND	ND	1.6 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl Naphthalene Isomer	ppm	ND	ND	1.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown	ppm	56.11 J	252.9 J	40.48 J	27.4 J	6017 J	8260 J	66.96 JA	2429 J	355.2 J	5086 J	567 J	2920 J	124.7 J
Unknown Thioglycolate	ppm	ND	ND	ND	ND	420 J	ND	ND	ND	ND	ND	ND	ND	6.3 NJ
Thioglycol	ppm	ND	ND	ND	ND	ND	ND	2.3 NJ	ND	ND	ND	ND	ND	ND
1-Hexanol, 3,5,5-Trimethyl	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200 NJ	ND
Dodecanoic Acid	ppm	ND	50 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total TIC's	ppm	61.01	513.2	50.6	756.60	10660	12550	97.76	5309	491.1	9400	996	10630	324.8
TCL PESTICIDES/PCBs														
delta-BHC	ppm	ND	ND	ND	0.011 J	ND	ND	ND	0.028 JK	ND	ND	ND	ND	ND
gamma-BHC(Lindane)	ppm	ND	ND	ND	ND	ND	ND	ND	0.0226 K	ND	ND	ND	ND	ND
Heptachlor	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlorepoxide	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ppm	0.0056 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.058 J	ND
Dieldrin	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.034 J	ND
4,4-DDE	ppm	ND	ND	ND	ND	ND	ND	ND	0.0068 JK	ND	ND	ND	ND	ND
4,4-DDD	ppm	0.0045 J	0.0047 JK	ND	0.043 J	0.028 J	0.042 J	ND	0.018 K	ND	0.051 J	ND	ND	ND
Endosulfan sulfate	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDT	ppm	ND	ND	ND	ND	ND	ND	ND	0.015 JK	ND	ND	0.0037 J	ND	ND
Endrin ketone	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-Chlordane	ppm	0.005 J	ND	ND	ND	ND	ND	ND	ND	ND	0.025 J	ND	ND	ND
gamma-Chlordane	ppm	ND	0.0062 JK	ND	ND	ND	ND	ND	ND	ND	0.071 J	ND	0.032 J	ND
Aroclor-1254	ppm	0.24	0.3 JK	ND	0.095 J	ND	ND	ND	ND	ND	2.8 J	0.099 J	ND	ND
Aroclor-1260	ppm	0.23	0.35 JK	ND	0.040 J	ND	ND	ND	ND	ND	1.9 J	ND	ND	ND

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.

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K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.

N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

A (TICs) - Indicates that a TIC is a suspected aldol-condensation product

R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals

ND - Compound not detected.

ORIGINAL
(Red)

TABLE 5
SUMMARY OF SOIL ANALYTICAL DATA - DRAINAGE DITCH
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE
PAGE 2 OF 6

Sample ID:		128 (DUP-6)	126	127	132	136	142 (DUP-7)	137	139	143 (DUP-8)	140	144 (DUP-9)	141	145 (DUP-10)
Sample Location:		TP-18	TP-21	TP-21	TP-23	TP-34	TP-34	TP-34	TP-35	TP-35	TP-35	TP-35	TP-36	TP-36
Lab Sample Number:		36650	36648	36649	36788	37299	37305	37300	37302	37306	37303	37307	37304	37308
Sampling Date:		12/15/95	12/15/95	12/15/95	12/18/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95
Depth (feet):		9.7-10.2	8.0-8.5	11.5-12.0	7.5-8.0	4.0-4.5	4.0-4.5	9.5-10.0	5.0-5.5	5.0-5.5	9.5-10.0	9.5-10.0	9.5-10.0	9.5-10.0
PARAMETERS	Units													
VOLATILE COMPOUNDS *														
Chloromethane	ppm	ND	ND	ND	810	ND	ND	ND	ND	ND	ND	ND	ND	ND
MethyleneChloride	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CarbonDisulfide	ppm	810 J	28000	16000	9000	22	22	2	0.75 J	2.7 J	2.8	2.8	3900	2900
1,1-Dichloroethene	ppm	ND	ND	ND	810	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ppm	ND	ND	ND	ND	0.11 J	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ppm	ND	ND	ND	ND	0.14 J	ND	ND	ND	ND	ND	ND	ND	ND
Total Confident Conc. VOAs	ppm	810	28000	16000	10620	22.25	22	2	0.75	2.7	2.8	2.8	3900	2900
Tentatively Identified Compounds (TICs)														
Unknown Siloxane	ppm	ND	1500 R	ND	ND	1.4 JB	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ppm	ND	ND	ND	ND	0.96 NJ	0.99 NJ	1.1 NJ	ND	ND	1.6 NJ	1.7 NJ	ND	ND
C9H18 Hydrocarbon	ppm	ND	ND	ND	ND	ND	ND	ND	49.3 J	125.8 J	ND	ND	ND	ND
Unknowns	ppm	ND	ND	ND	ND	1.9 J	4.3 J	ND	66.4 J	151.4 J	ND	ND	ND	ND
Total TIC s	ppm	ND	ND	ND	ND	2.86	5.29	1.1	115.7	277.2	1.6	1.7	ND	ND
SEMIVOLATILE COMPOUNDS														
Phenol	ppm	ND	ND	ND	0.21 J	ND	ND	0.38 J	ND	ND	ND	ND	ND	ND
4-Methylphenol	ppm	ND	0.55 J	ND	0.32 J	ND	ND	ND	ND	ND	0.38 J	0.32 NJ	ND	ND
Naphthalene	ppm	ND	0.092 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37 R	ND R
Phenanthrene	ppm	ND	ND	ND	ND	ND	0.4 NJ	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ppm	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	ND	ND	ND	ND
Total Confident Conc. BNAs	ppm	ND	0.642	ND	0.53	0.2	0.4	0.38	ND	ND	0.38	0.32	ND	ND
Tentatively Identified Compounds														
Unknown Alcohol	ppm	168.5 J	19 J	52.7 J	48.9 J	20 J	26 J	2.7 J	190 J	8440 J	ND	ND	148.4 J	101 J
C6H12 Hydrocarbons	ppm	ND	23 J	29 J	21 J	ND	ND	1.3 J	ND	750 J	ND	ND	64 J	46 J
Unknown Organic Acids	ppm	ND	ND	ND	ND	21 J	ND	14.59 J	ND	ND	59.7 J	250.8 J	83.5 J	156 J
Octyl Thioglycolate	ppm	ND	ND	2.7 NJ	ND	120 NJ	270 NJ	ND	ND	390 NJ	ND	ND	ND	ND
Unknown	ppm	69.3 J	104.6 J	31.5 J	105.5 J	578.9 J	1294 J	12.19 J	6261 J	15970 J	74.1 J	44.8 J	317.5 J	1276 J
Unknown Aromatic	ppm	ND	ND	ND	ND	ND	ND	0.88 J	ND	ND	ND	ND	ND	ND
Thiodiglycol	ppm	10 NJ	9.4 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	14 NJ	ND
2-Thiazolidinethione	ppm	ND	4.6 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1H-Cycloproba (A) Napth.	ppm	ND	ND	ND	1.2 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dodecanoic Acid	ppm	ND	ND	ND	ND	7.7 R	240 R	32 NJ	ND	ND	ND	ND	ND	230 R
Benzaldehyde	ppm	ND	ND	ND	ND	ND	ND	2.6 NJ	ND	ND	ND	ND	ND	ND
Acetophenone	ppm	ND	ND	ND	ND	ND	ND	2.1 NJ	ND	ND	ND	ND	ND	ND
Benzoic Acid	ppm	ND	ND	ND	ND	ND	ND	1.6 NJ	ND	ND	ND	5.4 NJ	ND	32 R
1,2-Ethanediol, 1-Penyl-	ppm	ND	ND	ND	ND	ND	ND	0.4 NJ	ND	ND	ND	ND	ND	ND
2-Propen-1-one,1,3-diphenyl	ppm	ND	ND	ND	ND	ND	ND	0.46 NJ	ND	ND	ND	ND	ND	ND
1,3-Propanedione,1,3-diphen	ppm	ND	ND	ND	ND	ND	ND	0.85 NJ	ND	ND	ND	ND	ND	ND
1,4-Butanedione,1,4-Diphenyl	ppm	ND	ND	ND	ND	ND	ND	0.46 NJ	ND	ND	ND	ND	ND	ND
Total TIC s	ppm	247.8	160.6	115.9	176.6	739.9	1590	72.13	6451	25550	133.8	301	627.4	1578
TCL PESTICIDES/PCBs														
delta-BHC	ppm	ND	0.056 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03 J	0.027 J
Heptachlor	ppm	ND	0.0041 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlorepoxide	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ppm	ND	ND	ND	ND	0.0035 JK	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4 -DDE	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfansulfate	ppm	ND	ND	ND	ND	ND	0.0048 JK	ND	ND	ND	ND	ND	ND	ND
Endrinketone	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-Chlordane	ppm	ND	0.0053 J	ND	ND	ND	ND	ND	0.15 J	0.16 J	ND	ND	ND	ND
gamma-Chlordane	ppm	ND	ND	ND	ND	ND	ND	ND	0.043 J	ND	ND	ND	ND	ND
Aroclor-1260	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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TABLE 5
SUMMARY OF SOIL ANALYTICAL DATA - DRAINAGE DITCH
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE
PAGE 3 OF 6

Sample ID		163	164	160	162	165 (DUP-12)	153	154	151	152	156 (DUP-11)	149	150
Sample Location		TP-37	TP-37	TP-38	TP-38	TP-38	TP-39	TP-39	TP-40	TP-40	TP-40	TP-41	TP-41
Lab Sample Number		39081	39082	39078	39080	39083	39070	39071	39068	39069	39073	39066	39067
Sampling Date		1/30/96	1/30/96	1/30/96	1/30/96	1/30/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96
Depth (feet)		8.0-8.5	13.0-13.5	7.0-7.5	9.0-9.5	9.0-9.5	4.0-4.5	11.5-12.0	5.5-6.0	9.0-9.5	9.0-9.5	4.0-4.5	8.5-9.0
PARAMETERS	Units												
VOLATILE COMPOUNDS *													
Methylene Chloride	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CarbonDeuflide	ppm	17000	170	46	8.3	7.2	ND	ND	ND	ND	ND	ND	ND
Benzene	ppm	ND	ND	8.5	ND	ND	0.19 J	ND	ND	ND	ND	0.23 J	ND
Toluene	ppm	ND	ND	0.33 J	ND	ND	ND	ND	ND	ND	ND	0.071 J	ND
Ethylbenzene	ppm	ND	ND	0.62 J	ND	ND	ND	ND	ND	ND	ND	0.12 J	ND
Total Confident Conc. VOAs	ppm	17000	170	55.45	8.3	7.2	0.19	ND	ND	ND	ND	0.421	ND
Tentatively Identified Compounds (TICs)													
Unknown Siloxane	ppm	ND	14 R	ND	ND	ND	ND	ND	ND	ND	0.55 R	ND	ND
Di-Isopropyl Ether	ppm	ND	ND	7.2 NJ	3.6 NJ	3.3 NJ	ND	ND	ND	ND	ND	ND	ND
C10H20 Hydrocarbon/coeluting	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.9 J	ND
Unknown Alkane	ppm	ND	ND	ND	ND	ND	1.76 J	ND	ND	ND	ND	3.56 J	ND
Unknown Alkane/Unknown	ppm	ND	ND	ND	ND	ND	0.65 J	ND	ND	ND	ND	ND	ND
C9H18 Cycloalkane	ppm	ND	ND	ND	ND	ND	2.5 J	ND	ND	ND	ND	ND	ND
C9H18 Cycloalkane/Unknown	ppm	ND	ND	ND	ND	ND	0.36 J	ND	ND	ND	ND	ND	ND
C9H18 Cycloalkane/C10H22 Alkane	ppm	ND	ND	ND	ND	ND	1.36 J	ND	ND	ND	ND	ND	ND
C9H20 Alkane	ppm	ND	ND	ND	ND	ND	1.48 J	ND	ND	ND	ND	0.81 J	ND
C9H20 Alkane/Unknown	ppm	ND	ND	ND	ND	ND	0.57 J	ND	ND	ND	ND	ND	ND
C10H22 Alkane	ppm	ND	ND	ND	ND	ND	2.8 J	ND	ND	ND	ND	0.74 J	ND
C8H16 Cycloalkane	ppm	ND	ND	ND	ND	ND	1.17 J	ND	ND	ND	ND	ND	ND
Unknowne	ppm	ND	ND	ND	ND	ND	4.86 J	ND	ND	ND	ND	1.57 J	ND
Cyclohexane, methyl	ppm	ND	ND	2.5 NJ	ND	ND	ND	ND	ND	ND	ND	1.9 NJ	ND
Unknown Cycloalkane	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9 J	ND
Dimethylcyclohexane Isomer	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.22 J	ND
Ethylmethylcyclohexane Isomer	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.5 J	ND
Unknown Hydrocarbons	ppm	ND	ND	ND	ND	ND	1.44 J	ND	ND	ND	ND	2.7 J	ND
C11H24 Alkane/coeluting unknown	ppm	ND	ND	ND	ND	ND	2.34 J	ND	ND	ND	ND	1.8 J	ND
C11H24 Alkane/C10H20 Cycloalkane	ppm	ND	ND	ND	ND	ND	1.8 J	ND	ND	ND	ND	ND	ND
C11H24 Alkane/unknown	ppm	ND	ND	ND	ND	ND	0.54 J	ND	ND	ND	ND	ND	ND
C10H20 Cycloalkane/Unknown	ppm	ND	ND	ND	ND	ND	3.1 J	ND	ND	ND	ND	ND	ND
C10H20 Cycloalkane	ppm	ND	ND	ND	ND	ND	3.4 J	ND	ND	ND	ND	3 J	ND
Trimethylcyclohexane Isomer	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6 J	ND
Coeluting Unknowns	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5 J	ND
Trimethylbenzene Isomer	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.99 J	ND
Decahydronaphthalene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3 J	ND
Decahydronaphthalene Isomer	ppm	ND	ND	ND	ND	ND	2.3 J	ND	ND	ND	ND	ND	ND
C9H10/C10H14 Aromatic	ppm	ND	ND	2.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10H14 Aromatic/Unknown Hydrocarbon	ppm	ND	ND	ND	ND	ND	0.9 J	ND	ND	ND	ND	ND	ND
Ethyldimethylbenzene Isomer	ppm	ND	ND	1.7 J	ND	ND	ND	ND	ND	ND	ND	5.66 J	ND
Diethylbenzene Isomer	ppm	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND
Total TIC s	ppm	ND	ND	13.9	3.6	3.3	34.73	ND	ND	ND	ND	37.35	ND
SEMIVOLATILE COMPOUNDS													
Phenol	ppm	ND	0.21 J	0.33 J	ND	ND	ND	0.045 J	0.02 NJ	ND	ND	0.94 J	ND
4-Methylphenol	ppm	0.2 J	0.025 J	1.2 J	0.031 J	0.023 J	ND	ND	0.01 NJ	ND	ND	ND	ND
Naphthalene	ppm	0.024 NJ	ND	2.7 J	ND	ND	ND	ND	0.007 NJ	ND	ND	0.83 J	ND
2-Methylnaphthalene	ppm	ND	ND	2.9 J	ND	ND	ND	ND	0.005 NJ	ND	ND	1.8 J	ND
Acenaphthylene	ppm	ND	ND	0.091 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ppm	ND	ND	2.9 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ppm	ND	ND	2.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ppm	0.008 NJ	ND	22	ND	ND	0.17 J	ND	0.008 NJ	ND	ND	1.4 J	ND
Anthracene	ppm	ND	ND	4.7 J	ND	ND	0.04 J	ND	ND	ND	ND	0.31 NJ	ND
Carbazole	ppm	ND	ND	0.96 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ppm	0.016 NJ	ND	16	ND	ND	0.042 J	ND	0.017 NJ	ND	ND	1 NJ	ND
Pyrene	ppm	0.014 NJ	ND	23	ND	ND	0.1 J	ND	0.015 NJ	ND	ND	1.6 J	ND
Benzo(a)anthracene	ppm	ND	ND	12	ND	ND	0.022 NJ	ND	0.01 NJ	ND	ND	0.56 J	ND
Chrysene	ppm	ND	ND	14	ND	ND	0.023 J	ND	0.013 NJ	ND	ND	0.67 J	ND
bis(2-Ethylhexyl)phthalate	ppm	0.069 B	ND	ND	0.19 B	0.34 B	0.07 B	0.06 B	0.069 B	ND	ND	1.9 B	0.048 B
Benzo(b)fluoranthene	ppm	ND	ND	8.4	ND	ND	0.022 J	ND	0.014 NJ	ND	ND	0.62 J	ND
Benzo(k)fluoranthene	ppm	ND	ND	3.1 J	ND	ND	0.007 NJ	ND	0.004 NJ	ND	ND	0.19 NJ	ND
Benzo(a)pyrene	ppm	ND	ND	9	ND	ND	0.016 NJ	ND	0.009 NJ	ND	ND	0.64 J	ND
Indeno(1,2,3-cd)pyrene	ppm	ND	ND	3.3 J	ND	ND	0.013 NJ	ND	0.006 NJ	ND	ND	0.49 NJ	ND
Dibenz(a,h)anthracene	ppm	ND	ND	1.2 J	ND	ND	ND	ND	ND	ND	ND	0.26 NJ	ND
Benzo(g,h,i)perylene	ppm	ND	ND	3.8 J	ND	ND	0.016 NJ	ND	0.004 NJ	ND	ND	0.59 NJ	ND
Total Confident Conc BNAs	ppm	0.262	0.235	154.361	0.031	0.023	0.471	0.045	0.142	ND	ND	12.31	ND
Tentatively Identified Compounds													
Unknown Alcohol	ppm	2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown Organic Acids	ppm	9.9 J	1.81 J	195 J	16.58 J	16.93 J	ND	15.6	ND	ND	ND	ND	ND
Unknown	ppm	41.44 J	4.26 J	43 J	2.236 J	2.823 J	14.06 J	4.64 J	3.98 J	ND	0.16 J	1.245 J	0.1 J
Unknown	ppm	1.3 R	2.6 R	ND	2.2 R	1.27 R	ND	ND	ND	ND	0.23 R	ND	ND
Thiodiglycol	ppm	ND	0.7 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzaldehyde	ppm	ND	0.76 NJ	ND	0.18 NJ	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	ppm	ND	1 NJ	ND	0.42 NJ	ND	ND	ND	ND	ND	ND	1.2 R	ND
Benzoic Acid	ppm	0.8 NJ	0.39 NJ	ND	0.18 NJ	0.86 NJ	ND	ND	1.4 NJ	0.3 NJ	0.42 NJ	1.3 NJ	ND
1,3-Propanedione,1,3-diphen	ppm	ND	0.45 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown Aldol Condensate	ppm	89 R	96.78 R	ND	10.88 R	12.11 R	92.1 R	100.91 JAB	1.01 JA	ND	12.171 R	ND	5.88 R
Unknown Aldol Condensate	ppm	ND	0.51 JA	ND	1.1 JA	0.61 JA	ND	0.38 JA	ND	0.16 JA	0.22 JA	ND	ND
Benzeneacetic Acid	ppm	ND	ND	ND	ND	ND	ND	0.093 NJ	ND	ND	ND	ND	ND
Lauric Acid	ppm	4.4 BNJ	5.3 NJB	ND	3 R	0.44 R	ND	ND	ND	ND	0.28 R	7.9 R	ND
Decahydromethyl naphthalene	ppm	ND	ND	ND	ND	ND	3.8 J	ND	ND	ND	ND	5.9 J	ND
Decahydro naphthalene Isomer	ppm	ND	ND	ND	ND	ND	1.5 J	ND	ND	ND	ND	ND	ND
Trimethylnaphthalene Isomer	ppm	ND	ND	ND	ND	ND	1.51 J	ND	ND	ND	ND	3.8 J	ND
C16H36 Alkane	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown Aldehyde	ppm	ND	0.096 J	ND	ND	ND	ND	ND	0.1 J	ND	ND	ND	ND
Unknown Alkane	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown Alkene	ppm	ND	ND	ND	ND	ND	ND	ND	0.19 J	ND	ND	ND	ND
7-Thiabicyclo heptane	ppm	ND	0.16 NJ	ND	0.24 NJ	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl napthalene Isomer/Unknown	ppm	ND	ND	ND	ND	ND	ND	ND	ND	0.1 J	ND	ND	ND
C15H12 PAH	ppm	ND	ND	25.6 J	ND	ND	0.64 J	ND	ND	ND	ND	ND	ND
C16H14 PAH	ppm	ND	ND	26.5 J	ND	ND	0.64 J	ND	ND	ND	ND	ND	ND
Methoxychlor/Carryover	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.092 NJ	ND	ND
Palmitic Acid	ppm	1 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ppm	ND	0.14 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethanone,2-hydroxy-1-phenyl	ppm	ND	0.14 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (B) Naptho (2,1-D) Thioph	ppm	ND	ND	3.6 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15H10/C15H12 PAHs	ppm	ND	ND	13 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C16H12 PAH	ppm	ND	ND	5.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C17H14 PAH	ppm	ND	ND	6.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C17H12 PAH	ppm	ND	ND	41.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C18H12 PAH	ppm	ND	ND	26.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C19H14 PAH	ppm	ND	ND	10 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C20H12 PAH	ppm	ND	ND	6.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
C22H12 PAH	ppm	ND	ND	5.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total TIC s	ppm	55.14	10.276	40.75	20.936	21.223	22.15	20.713	6.6	0.56	0.892	147.2	0.1
TCL PESTICIDES/PCBs													
delta-BHC	ppm	ND	ND	0.0065 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	ppm	ND	ND	0.0058 J	ND	ND	ND	ND	ND	ND	ND	0.015 J	ND
4,4'-DDT	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0048 J	ND

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.
J - Analyte present. Reported value may not be accurate or precise
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity
A (TICs) - Indicates that a TIC is a suspected aldol-condensation product
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.

20616/SOIL95/DRAIN2.XLS

ORIGINAL (Red)

TABLE 5
SUMMARY OF SOIL ANALYTICAL DATA - DRAINAGE DITCH
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID		112	111	113	114	116	121 (DUP-5)	117	088	089	118	119	120	125	128 (DUP-6)	126	127	132	136	142 (DUP-7)
Sample Location		TP-7	TP-7	TP-8	TP-8	TP-11	TP-11	TP-11	TP-12	TP-12	TP-13	TP-13	TP-18	TP-18	TP-18	TP-21	TP-21	TP-23	TP-34	TP-34
Lab Sample Number		36528	36527	36529	36530	36532	36537	36533	36272	36273	36534	36535	36536	36647	36650	36648	36649	36788	37299	37305
Sampling Date		12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/12/95	12/12/95	12/14/95	12/14/95	12/14/95	12/15/95	12/15/95	12/15/95	12/15/95	12/18/95	12/28/95	12/28/95
Depth (feet)		2.5-3.0	4.5-5.0	3.0-3.5	7.0-7.5	3.5-4.0	3.5-4.0	9.5-10.0	3.5-4.0	5.5-6.0	5.5-6.0	11.5-12.0	5.5-6.0	9.7-10.2	9.7-10.2	8.0-8.5	11.5-12.0	7.5-8.0	4.0-4.5	4.0-4.5
PARAMETERS	Units																			
METALS																				
Aluminum	ppm	4910	8740	9330	7360	4800	2190	9580	4490	10100	1160	4330	5490	9530	9810	15800	8430	19000	3420	6520
Antimony	ppm	ND	ND	ND	ND	ND	ND	ND	3.5 L	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9 L	3.5 L
Arsenic	ppm	463	303	238	137	8770	7580	5.1	334	8.7	1310	33.4	3310	8.8	5.4	322	5.4	163	523	355
Barium	ppm	90.5	104	78.1	36.2	181	320	64.7	210	40.8	811	29.1	79.7	48.3	44.0	127	45.4	97.8	332	148
Beryllium	ppm	3.1	0.53	0.31	0.19	0.39	0.10 J	0.48	0.22	0.39	ND	0.27	3.7	0.58	0.37	0.49	0.40	0.92	0.22	0.35
Cadmium	ppm	1.5	1.5	0.10 J	ND	18.0	17.5	0.32	1.7 J	ND	2.6	0.25	97.4	0.72	0.46	0.34	0.45	0.47	1.5	1.2
Calcium	ppm	1110	2880	951	91.7	1940	1050	68.0	807	164	678	62.9	11700	82.5	88.3	536	128	784	822	679
Chromium	ppm	58.1	29.5	40.1	18.7	48.3	39.4	20.2	23.6	19.2	16.4	15.6	188	25.7	22.7	46.6	16.6	48.0	20.4	23.1
Cobalt	ppm	15.6	19.3	12.8	3.6	94.9	59.8	4.4	102	3.6	57.4	3.2	882	4.8	4.7	15.1	8.2	13.3	65.1	56.3
Copper	ppm	628	1250	119	9.7	13100	9190	11.1	188 J	19.1 J	2260	14.3	2330	10.9	9.2	120	10.8	9.9	474	239
Iron	ppm	20800	24600	19800	13900	18700	10800	18700	78900	19700	15800	14200	124000	34900	25300	11500	23100	23600	36900	35300
Lead	ppm	284	306	148	15.6	420	417	6.7	292	22.8	88.4	25.1	154	5.6	6.2	30.5	4.3	9.7	1870	657
Magnesium	ppm	1220	1980	1940	1510	1160	372	2190	891	1690	206	849	3640	1910	2140	2570	2210	5070	915	1730
Manganese	ppm	201	262	122	52.3	368	187	119	315	75.2	69.6	46.5	9030	86.4	78.4	88.8	88.7	167	140 L	161 L
Mercury	ppm	5.5	1.3	0.44	ND	3.1 J	79.5 J	ND	0.51	0.14	14.6	ND	9.2	ND	ND	0.14	ND	ND	0.57	0.23
Nickel	ppm	63.9	18.5	13.0	7.6	42.8	34.8	11.0	23.0	8.1	19.1	5.9	122	10.7	10.8	15.9	11.9	22.2	13.9	16.4
Potassium	ppm	767	965	1140	603	597	261	986	276	600	307	602	654	859	999	1720	1530	1730	553	1040
Selenium	ppm	0.93 B	1.5 B	ND	ND	ND	ND	ND	1.2 L	ND	2.1	ND	ND	ND	ND	ND	ND	ND	2.4 L	1.6 L
Silver	ppm	1.3	0.89	0.35 J	ND	2.3 L	4.2	ND	3.8	ND	19.5	ND	0.98 L	ND	ND	ND	ND	ND	4.1	2.1
Sodium	ppm	443 B	1780	228 B	378 B	2100	1860	821	350 B	331 B	437 B	571 B	22900	2670	2650	11200	1080	7470	445 B	496
Thallium	ppm	1.4 L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ppm	3180	33.4	31.3	29.1	27.8	20.3	38.2	31.8	29.8	8.4	20.6	39.3	42.3	35.4	53.5	27.5	47.7	21.9	28.1
Zinc	ppm	1360	827	275	49.0	12600	13500	91.9	825	47.7	1120	42.9	64400	34.1	32.7	1580	31.3	124	830	732
Cyanide	ppm	11.9	2.6	2.5	ND	26.2	19.8	ND	1.2	ND	38.2	ND	14.7	0.93	ND	ND	ND	ND	2.5 L	1.9 L

B - Not detected substantially above the level reported in laboratory or field blanks
J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
ND - Compound not detected

Sample ID		137	139	143 (DUP-8)	140	144 (DUP-9)	141	145 (DUP-10)	163	164	160	162	165 (DUP-12)	153	154	151	152	156 (DUP-11)	149	150
Sample Location		TP-34	TP-35	TP-35	TP-35	TP-35	TP-36	TP-36	TP-37	TP-37	TP-38	TP-38	TP-38	TP-39	TP-39	TP-40	TP-40	TP-40	TP-41	TP-41
Lab Sample Number		37300	37302	37306	37303	37307	37304	37308	39081	39082	39078	39080	39083	39070	39071	39068	39069	39073	39066	39067
Sampling Date		12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	1/30/96	1/30/96	1/30/96	1/30/96	1/30/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96
Depth (feet)		9.5-10.0	5.0-5.5	5.0-5.5	9.5-10.0	9.5-10.0	9.5-10.0	9.5-10.0	8.0-8.5	13.0-13.5	7.0-7.5	9.0-9.5	9.0-9.5	4.0-4.5	11.5-12.0	5.5-6.0	9.0-9.5	9.0-9.5	4.0-4.5	8.5-9.0
PARAMETERS	Units																			
METALS																				
Aluminum	ppm	10100	5820	10300	9600	11200	12900	8530	13300	12200	16100	19700	18600	12900	8980	5040	14200	14600	8010	16900
Antimony	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3 BL	ND	ND	ND	ND	ND	ND	ND	ND	1.2 L
Arsenic	ppm	5.1	11900	7500	2.9	3.5	463	173	6.3	5.4	776	5.3	5.7	2.9	2.3	36.5	5.9	5.6	5.5	6.0
Barium	ppm	36.7	216	315	38.8	45.1	75.1	57.5	72.5	54.7	174	61.2	58.7	169	43.5	73.9	45.3	44.1	104	53.4
Beryllium	ppm	0.47	2.1	1.5	0.40	0.45	1.8	1.0	1.5	0.50	1.1	0.62	0.64	0.55	0.44	0.16	0.53	0.51	0.48	0.54
Cadmium	ppm	ND	98.8	52.8	ND	ND	ND	ND	ND	ND	3.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	ppm	80.4 B	5460	2920	70.1 B	86.4 B	606	320	205	91.5	2700	160	172	5180	105 B	1130	642	497	29000	232
Chromium	ppm	19.1	154	94.5	18.0	20.7	25.8	14.5	20.6	33.6	36.9	36.2	35.3	46.6	19.5	15.7	31.3	31.1	41.8	29.3
Cobalt	ppm	5.9 B	1210	501	5.8	6.8	14.9	9.7	7.8	6.2	68.8	7.4	7.0	13.0	4.9	2.4	6.4	6.3	7.1	6.4
Copper	ppm	10.7	4990	4970	10.9	12.9	11.1	5.7	7.8	12.5	546	14.2	13.4	58.1	6.8	36.6	18.6	19.3	45.1	20.8
Iron	ppm	22200	83200	57600	18400	21300	15900	6940	7120	31500	22100	24700	25400	19900	12800	9100	29900	30500	16300	29900
Lead	ppm	15.1	365	425	5.3	5.2	8.0	5.4	6.7	6.9	571	9.3	8.9	19.6	7.1	72.6	15.4	20.7	75.9	17.3
Magnesium	ppm	2380	1580	2520	2120 J	2480	1790	1090	1680	2780	2820	2810	2760	7410	1860	1100	3170	3020	17800	2580
Manganese	ppm	144 L	4710 L	2180 L	74.8 L	88.4 L	108 L	76.0 L	55.7	104	167	88.2	88.0	164	64.8	65.6	130	117	313	143
Mercury	ppm	ND	17.3	10.4	ND	ND	ND	ND	ND	ND	0.31	ND	ND	1.4	ND	ND	0.07 J	ND	4.7	ND
Nickel	ppm	10.6	174	103	10.0	11.5	14.4	9.6	15.6	14.1	39.9	14.5	14.1	24.3	8.6	4.9	13.2	12.9	14.6	13.0
Potassium	ppm	1190 B	378	1080	1420	1710	657	331	385 B	1490	871	1460	1400	3420	647	598	1800	1780	1270	1410
Selenium	ppm	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ppm	ND	3.3	5.4	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	ppm	704 B	7190	4370	1030 B	1050 B	7030	4210	1690	677	2150 B	814	761	163 B	319 B	201 B	246 B	218 B	199 B	167 B
Thallium	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ppm	39.1	30.3	42.3	31.5	34.5	27.9	16.7	24.3	42.8	48.9	52.5	50.4	55.6	32.3	15.7	43.7	44.6	29.8	46.7
Zinc	ppm	55.3	63800	27400	29.3	32.6	31.2	21.1	1430	35.6	5320	38.8	37.2	73.9	26.6	31.6	63.7	53.01	99.1	48.2
Cyanide	ppm	ND	27.7 L	25.3 L	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	1.4	ND

B - Not detected substantially above the level reported in laboratory or field blanks.
J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher
ND - Compound not detected

ORIGINAL (Red)

AR306052

TABLE 5
SUMMARY OF SOIL ANALYTICAL DATA - DRAINAGE DITCH
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:			112	111	113	114	116	121 (DUP-5)	117	068	089	118	119	120	125	128 (DUP-6)	126	127	132	136	142 (DUP-7)
Sample Location:		RCRA	TP-7	TP-7	TP-8	TP-8	TP-11	TP-11	TP-11	TP-12	TP-12	TP-13	TP-13	TP-16	TP-16	TP-16	TP-21	TP-21	TP-23	TP-34	TP-34
Lab Sample Number:		Toxicity	36528	36527	36529	36530	36532	36537	36533	36272	36273	36534	36535	36536	36647	36650	36648	36649	36788	37299	37305
Sampling Date:		Reg.	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/12/95	12/12/95	12/14/95	12/14/95	12/14/95	12/15/95	12/15/95	12/15/95	12/15/95	12/18/95	12/28/95	12/28/95
Depth (feet):		Levels	2.5-3.0	4.5-5.0	3.0-3.5	7.0-7.5	3.5-4.0	3.5-4.0	9.5-10.0	3.5-4.0	5.5-6.0	5.5-6.0	11.5-12.0	5.5-6.0	9.7-10.2	9.7-10.2	8.0-8.5	11.5-12.0	7.5-8.0	4.0-4.5	4.0-4.5
PARAMETERS	*Units*																				
TCLP VOLATILE COMPOUNDS																					
VinylChloride	ppm	0.2	NA	0.001 J	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
Methyl Ethyl Ketone	ppm	200	NA	0.032	0.017	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	0.01	NA
Trichloroethene	ppm	-	NA	0.002	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
Benzene	ppm	0.5	NA	ND	0.003	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
Tetrachloroethene	ppm	-	NA	0.020	ND	NA	0.041 J	NA	NA	ND	NA	0.046 J	NA	ND	NA	NA	ND	NA	ND	ND	NA
Total Confident Conc. VOAs	ppm	-	NA	0.055	0.02	NA	0.041	NA	NA	ND	NA	0.046	NA	ND	NA	NA	ND	NA	ND	0.01	NA
TCLP EXTRACTABLE ORGANICS *																					
o-Cresol	ppm	200	NA	ND	ND	NA	ND	NA	NA	ND	NA	ND	NA	0.012 J	NA	NA	ND	NA	ND	ND	NA
m&p-Cresol	ppm	200	NA	0.019 J	ND	NA	ND	NA	NA	0.071	NA	ND	NA	0.048	NA	NA	ND	NA	0.010 J	ND	NA
Nitrobenzene	ppm	2	NA	ND	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
Total Confident Conc. BNAs	ppm	-	NA	0.019	ND	NA	ND	NA	NA	0.071	NA	ND	NA	0.060	NA	NA	ND	NA	0.010	ND	NA
TCLP PESTICIDES	ppm	-	NA	ND	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
TCLP HERBICIDES	ppm	-	NA	ND	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
TCLP METALS																					
Arsenic	ppm	5	NA	0.60	1.5	NA	36.1	NA	NA	2.7	NA	5.6	NA	ND	NA	NA	4.4	NA	2.2	0.6	NA
Barium	ppm	100	NA	7.9	0.82	NA	0.66	NA	NA	23.2	NA	11.7	NA	3.5	NA	NA	88.2	NA	126	4.7	NA
Chromium	ppm	5	NA	ND	ND	NA	0.03	NA	NA	0.01	NA	ND	NA	2.1	NA	NA	0.14	NA	ND	ND	NA
Mercury	ppm	0.2	NA	ND	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	0.0004 NL	NA
Selenium	ppm	1	NA	ND	ND	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
Lead	ppm	5	NA	ND	0.23	NA	ND	NA	NA	ND	NA	ND	NA	ND	NA	NA	ND	NA	ND	ND	NA
WET CHEMISTRY TESTS																					
Ignitability	deg F	=>140	>160	>160	>160	>160	>160	NA	>160	>160	>160	>160	>160	>160	>160	NA	>160	>160	>160	>160	NA
Corrosivity	std	2=<12.5	7.20	9.03	7.88	5.32	6.01	NA	5.27	5.21	4.53	7.08	5.07	8.79	4.31	NA	8.67	4.32	8.34	7.15	NA
Reactive Sulfide	ppm	-	447	337	ND	ND	ND	NA	ND	72.5	ND	219	50.3	65.1	ND	NA	94.6	ND	76.1	396	NA
Reactive Cyanide	ppm	-	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	NA
Total Organic Carbon	ppm	-	25600	39000	21000	4690	99400	153000	1100	41800	5200	68500	2410	93900	3240	2630	60500	1460	21800	35100	53600
Free Cyanide	ppm	-	ND	ND	ND	ND	22.4 R	ND R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiocyanate	ppm	-	16.7 L	94.3 L	9.0 L	136 L	92.9 L	134 L	269 L	122	122	247 L	625 L	12500 L	4180	4270	2890	743	1470	95.9	85.6

J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.
NA - Compound not analyzed.

ORIGINAL
(Red)

AR306053

TABLE 5
SUMMARY OF SOIL ANALYTICAL DATA - DRAINAGE DITCH
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:			137	139	143 (DUP-8)	140	144 (DUP-9)	141	145 (DUP-10)	163	164	160	161	162	165 (DUP-12)	153	154	151	152	156 (DUP-11)	149	150
Sample Location:		RCRA	TP-34	TP-35	TP-35	TP-35	TP-35	TP-36	TP-36	TP-37	TP-37	TP-38	TP-38	TP-38	TP-38	TP-39	TP-39	TP-40	TP-40	TP-40	TP-41	TP-41
Lab Sample Number:		Toxicity	37300	37302	37306	37303	37307	37304	37308	39081	39082	39078	39079	39080	39083	39070	39071	39068	39069	39073	39066	39067
Sampling Date:		Reg.	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	12/28/95	1/30/96	1/30/96	1/30/96	1/30/96	1/30/96	1/30/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96	1/29/96
Depth (feet):		Levels	9.5-10.0	5.0-5.5	5.0-5.5	9.5-10.0	9.5-10.0	9.5-10.0	9.5-10.0	8.0-8.5	13.0-13.5	7.0-7.5	7.0-7.5	9.0-9.5	9.0-9.5	4.0-4.5	11.5-12.0	5.5-6.0	9.0-9.5	9.0-9.5	4.0-4.5	8.5-9.0
PARAMETERS	Units																					
TCLP VOLATILE COMPOUNDS																						
VinylChloride	ppm	0.2	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Methyl Ethyl Ketone	ppm	200	NA	0.03	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Trichloroethene	ppm	-	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Benzene	ppm	0.5	NA	ND	NA	NA	NA	ND	NA	ND	NA	0.091	NA	NA	NA	ND	NA	ND	NA	NA	0.001	NA
Tetrachloroethene	ppm	-	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Total Confident Conc. VOAs	ppm	-	NA	0.03	NA	NA	NA	ND	NA	ND	NA	0.091	NA	NA	NA	ND	NA	ND	NA	NA	0.001	NA
TCLP EXTRACTABLE ORGANICS *																						
o-Cresol	ppm	200	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
m&p-Cresol	ppm	200	NA	0.02 J	NA	NA	NA	0.016 J	NA	0.01 J	NA	0.052 J	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Nitrobenzene	ppm	2	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Total Confident Conc. BNAs	ppm	-	NA	0.02	NA	NA	NA	0.016	NA	0.01	NA	0.052	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
CLP PESTICIDES	ppm	-	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
TCLP HERBICIDES	ppm	-	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
TCLP METALS																						
Arsenic	ppm	5	NA	0.18	NA	NA	NA	3	NA	ND	NA	4	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Barium	ppm	100	NA	14.4	NA	NA	NA	19.1	NA	0.27	NA	0.63	NA	NA	NA	1.1	NA	1.9	NA	NA	1.5	NA
Chromium	ppm	5	NA	0.35	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Mercury	ppm	0.2	NA	0.0003 NL	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Selenium	ppm	1	NA	0.03	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
Lead	ppm	5	NA	ND	NA	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	ND	NA	NA	ND	NA
WET CHEMISTRY TESTS																						
Ignitability	deg F	=>140	>160	>160	NA	>160	NA	>160	NA	>160	>160	>160	NA	>160	NA	>160	>160	>160	>160	NA	>160	>160
Corrosivity	std	2=<12.5	4.54	7.82	NA	5.91	NA	7.69	NA	5.57	4.7	7.07	NA	5.78	NA	8.23	6.13	7.51	7.24	NA	7.71	6.16
Reactive Sulfide	ppm	-	ND	609	NA	ND	NA	102	NA	ND	ND	122	NA	ND	NA	ND	ND	166	ND	NA	ND	ND
Reactive Cyanide	ppm	-	ND	ND	NA	ND	NA	ND	NA	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	ND	ND
Total Organic Carbon	ppm	-	1260	64800	63000	1200	1330	47000	44100	82000	1090	49100	NA	1860	NA	8600	1290	8870	1200	NA	28300	1340
Free Cyanide	ppm	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiocyanate	ppm	-	922	10.9	22.3	411	536	1490	1360	832	274	328	591	135	192	ND	ND	ND	ND	ND	ND	ND

J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.
NA - Compound not analyzed.

TABLE 6
SUMMARY OF SOIL ANALYTICAL DATA - SUMP AREA
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:		072	073	091	090	110	109	092	094
Sample Location:		TP-24	TP-24	TP-25	TP-25	TP-26	TP-26	TP-27	TP-27
Lab Sample Number:		36174	36175	36275	36274	36526	36525	36276	36278
Sampling Date:		12/11/95	12/11/95	12/12/95	12/12/95	12/14/95	12/14/95	12/12/95	12/12/95
Depth (feet):		2.6-3.1	4.3-4.8	2.5-3.0	4.0-4.5	1.7-2.2	3.9-4.4	3.0-3.5	4.5-5.0
PARAMETERS	Units								
VOLATILE COMPOUNDS *									
Acetone	ppm	0.39 J	ND	ND	ND	ND	ND	ND	ND
CarbonDisulfide	ppm	0.36 J	0.18 J	ND	ND	0.12 J	0.13 J	ND	ND
Xylenes (total)	ppm	ND	ND	ND	ND	0.041 J	ND J	ND	ND
Total Confident Conc VOAs	ppm	0.75	0.18	ND	ND	0.161	0.13 J	ND	ND
Tentatively Identified Compounds (TICs)									
Unknown Hydrocarbons	ppm	ND	ND	0.38 J	ND	ND	ND	ND	ND
Unknown Alcohol	ppm	ND	ND	0.72 J	ND	ND	ND	ND	ND
Unknown	ppm	ND	ND	0.39 J	1.8 J	ND	ND	ND	ND
C9H10 Aromatic	ppm	ND	ND	ND	ND	0.3 J	ND	ND	ND
Ethyldimethylbenzene Isomer	ppm	ND	0.44 J	ND	ND	ND	ND	ND	ND
Diisopropyl Ether	ppm	0.71 NJ	0.68 NJ	ND	ND	ND	ND	ND	ND
Total TICs	ppm	0.71	1.12	1.49	1.8	0.3	ND	ND	ND
SEMIVOLATILE COMPOUNDS									
Phenol	ppm	0.43 J	ND	ND	ND	ND	ND	0.051 J	ND
4-Methylphenol	ppm	0.24 J	ND	ND	0.15 NJ	ND	ND	0.041 J	0.006 NJ
Naphthalene	ppm	0.28 J	ND	0.21 J	ND	0.19 J	ND	0.075 J	0.006 NJ
2-Methylnaphthalene	ppm	0.37 J	ND	0.19 J	ND	ND	0.004 NJ	0.1 J	ND
Acenaphthylene	ppm	0.043 NJ	ND	ND	ND	ND	ND	0.06 J	ND
Acenaphthene	ppm	0.012 NJ	ND	ND	ND	ND	ND	0.02 J	ND
Dibenzofuran	ppm	0.13 J	ND	ND	ND	ND	ND	0.049 J	ND
Fluorene	ppm	0.04 J	ND	ND	ND	ND	ND	0.042 J	ND
Hexachlorobenzene	ppm	0.054 NJ	ND	ND	ND	ND	ND	0.052 J	ND
Phenanthrene	ppm	0.52 J	0.014 NJ	0.16 J	ND	0.15 J	ND	0.46	0.018 J
Anthracene	ppm	0.05 J	ND	0.029 NJ	ND	0.044 NJ	ND	0.084 J	ND
Carbazole	ppm	0.036 J	ND	ND	ND	ND	ND	0.039 J	ND
Di-n-butylphthalate	ppm	ND	ND	0.55 J	ND	ND	ND	ND	ND
Fluoranthene	ppm	0.39 J	0.027 NJ	0.069 NJ	ND	0.19 J	ND	0.76	0.051 J
Pyrene	ppm	0.31 J	0.02 NJ	0.066 NJ	ND	0.16 J	ND	0.72	0.041 J
Benzo(a)anthracene	ppm	0.2 J	0.019 NJ	ND	ND	0.052 NJ	ND	0.38 J	0.023 J
Chrysene	ppm	0.3 J	0.018 NJ	ND	ND	0.09 NJ	ND	0.47	0.028 J
bis(2-Ethylhexyl)phthalate	ppm	ND	ND	0.7 B	ND	1.6 J	ND	0.044 B	0.057 B
Benzo(b)fluoranthene	ppm	0.32 J	0.032 NJ	ND	ND	0.073 NJ	ND	0.51	0.028 J
Benzo(k)fluoranthene	ppm	0.094 J	0.015 NJ	ND	ND	0.026 NJ	ND	0.17 J	0.012 NJ
Benzo(a)pyrene	ppm	0.17 J	0.023 NJ	ND	ND	0.032 NJ	ND	0.39 J	0.023 J
Indeno(1,2,3-cd)pyrene	ppm	0.11 J	0.013 NJ	ND	ND	0.03 NJ	ND	0.24 J	0.016 NJ
Dibenz(a,h)anthracene	ppm	ND	ND	ND	ND	ND	ND	0.018 NJ	ND
Benzo(g,h,i)perylene	ppm	0.12 J	0.01 NJ	ND	ND	ND	ND	0.22 J	0.015 NJ
Total Confident Conc. BNAs	ppm	3.373	0.191	1.274	0.15	2.637	0.004	4.961	0.267
Tentatively Identified Compounds									
Unknown Aldol Condensate	ppm	2.3 J	ND	ND	ND	ND	0.69 JA	ND	2.65 R
Unknown Organic Acid	ppm	ND	30.1 J	ND	46.3 J	ND	4.19 J	ND	ND
Unknown Alcohol	ppm	ND	ND	2 J	72.9 J	18.1 J	ND	1.62 J	ND
Unknown Amine	ppm	ND	ND	ND	ND	5.2 J	ND	ND	ND
C6H12 Hydrocarbon	ppm	ND	ND	ND	ND	ND	ND	0.44 J	ND
Acetamide, N,N-Diethyl	ppm	ND	ND	ND	ND	ND	1.2 NJ	ND	ND
Benzaldehyde	ppm	1.1 NJ	1.3 NJ	ND	ND	ND	ND	ND	ND
Unknown	ppm	30.32 J	29.17 J	114.6 J	461.6 J	117.26 J	3.491 J	12.74 J	1.677 J
Dodecanoic Acid	ppm	12 JNB	8.5 JNB	ND	ND	ND	ND	ND	ND
C15H12 PAH	ppm	0.79 J	ND	ND	ND	ND	ND	0.23 J	ND
C16H14 PAH	ppm	0.62 J	ND	ND	ND	ND	ND	ND	ND
C15H10/C15H12 PAHS	ppm	ND	ND	ND	ND	ND	ND	0.2 J	ND
C20H12 PAH	ppm	ND	ND	ND	ND	ND	ND	0.38 J	ND
.Gamma. -Sitosterol	ppm	0.69 NJ	ND	ND	ND	ND	ND	ND	ND
7H-Benz(De)Anthracen-7	ppm	ND	ND	ND	ND	ND	ND	0.11 NJ	ND
2-Thiazolamine, 4-Methyl	ppm	ND	0.88 NJ	ND	ND	ND	ND	ND	ND
Benzoic Acid/Unknown	ppm	ND	1 NJ	ND	ND	ND	ND	ND	ND
Hexadecanoic Acid	ppm	ND	0.53 NJ	ND	ND	ND	ND	ND	ND
1,3-Propanedione, 1,3-Di	ppm	ND	0.72 NJ	ND	ND	ND	ND	ND	ND
Total TICs	ppm	35.82	63.7	116.6	580.8	140.56	8.881	15.72	1.677
TCL PESTICIDES/PCBs									
delta-BHC	ppm	2.9 JK	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	ppm	ND	ND	ND	ND	0.021 J	ND	ND	ND
alpha-Chlordane	ppm	ND	ND	0.11 R	ND	0.0037 J	ND	ND	ND
Aroclor-1254	ppm	ND	ND	ND	ND	0.13 J	ND	ND	ND
Aroclor-1260	ppm	ND	ND	ND	ND	0.057 J	ND	ND	ND
METALS									
Aluminum	ppm	2560	10500	11200	8130	21300	12100	3240	10900
Antimony	ppm	9.8 L	ND	ND	ND	ND	ND	ND	ND
Arsenic	ppm	568	15.4	63.5	4.5	1430	9.3	36.8	34.1
Barium	ppm	365	71.4	489	46.6	549	63.9	82.0	72.8
Beryllium	ppm	0.22	0.83	0.41	0.36	0.66	0.55	0.19	0.50
Cadmium	ppm	0.79	0.17 J	6.7	0.13	33.0	ND	ND	ND
Calcium	ppm	561	421	8740	264 J	7550	850	709	451
Chromium	ppm	9.5	22.2	304	21.9	91.1	24.2	9.0	21.6
Cobalt	ppm	4.5	9.7	31.6	3.6	56.0	6.7	2.6	4.8
Copper	ppm	742 J	14.1 J	6710 J	388 J	5250	42.7	92.6 J	22.1
Iron	ppm	10100	16800	134000	15400	54800	21500	11400	18200
Lead	ppm	2020	20.4	458	25.1	506	9.4	119	28.0
Magnesium	ppm	671	2420	10500	1500	13600	2430	925	1950
Manganese	ppm	101	157	559	83.0	497	129	79.1	120
Mercury	ppm	0.25	0.11	12.3	0.17	1.7	ND	0.17	0.07 J
Nickel	ppm	5.4	14.3	232	10.4	119	16.0	4.4	10.6
Potassium	ppm	344	762	476	536	873	1490	597	1260
Selenium	ppm	2.2 L	ND	0.57 L	ND	2.4 B	1.4 B	ND	0.88 B
Silver	ppm	3.0	ND	8.1	ND	6.3	ND	0.78	ND
Sodium	ppm	2390	2600	1860	677	5400 B	121 B	271 B	409 B
Vanadium	ppm	17.4	29.4	48.9	25.0	43.9	40.5	17.5	29.7
Zinc	ppm	167	176	6200	61.7	25400	82.7	30.9	41.9
Cyanide	ppm	10.3	ND	156	2.0	1.1	ND	4.3	ND

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.
J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
A (TICs) - Indicates that a TIC is a suspected aldol-condensation product.
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.

TABLE 6
SUMMARY OF SOIL ANALYTICAL DATA - SUMP AREA
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample ID:			072	073	091	090	110	109	092	094	Comp 092-094
Sample Location:		RCRA	TP-24	TP-24	TP-25	TP-25	TP-26	TP-26	TP-27	TP-27	TP-27
Lab Sample Number:		Toxicity	36174	36175	36275	36274	36526	36525	36276	36278	36283
Sampling Date:		Reg.	12/11/95	12/11/95	12/12/95	12/12/95	12/14/95	12/14/95	12/12/95	12/12/95	12/12/95
Depth (feet):		Levels	2.6-3.1	4.3-4.8	2.5-3.0	4.0-4.5	1.7-2.2	3.9-4.4	3.0-3.5	4.5-5.0	n/a
PARAMETERS	Units										
TCLP VOLATILE COMPOUNDS											
Methyl Ethyl Ketone	ppm	200	0.007 NJ	NA	0.022	NA	0.047	NA	NA	NA	ND
Total Confident Conc. VOAs	ppm	-	0.007	NA	0.022	NA	0.047	NA	NA	NA	ND
TCLP EXTRACTABLE ORGANICS *											
Total Confident Conc. BNAs	ppm	-	ND	NA	ND	NA	ND	NA	NA	NA	ND
TCLP PESTICIDES	ppm	-	ND	NA	ND	NA	ND	NA	NA	NA	ND
TCLP HERBICIDES	ppm	-	ND	NA	ND	NA	ND	NA	NA	NA	ND
TCLP METALS											
Arsenic	ppm	5	5.7	NA	ND	NA	3.5	NA	NA	NA	ND
Barium	ppm	100	25.7	NA	13.5 N	NA	8.1	NA	NA	NA	13.0
Chromium	ppm	5	ND	NA	0.01	NA	0.43	NA	NA	NA	ND
Lead	ppm	5	3.6	NA	ND	NA	ND	NA	NA	NA	0.15
Mercury	ppm	0.2	ND	NA	0.0003	NA	ND	NA	NA	NA	ND
WET CHEMISTRY TESTS											
Ignitability	deg F	=>140	>160	>160	>160	>160	>160	>160	>160	>160	NA
Corrosivity	std	2<=12.5	7.60	7.23	7.81	7.30	7.58	7.85	7.85	8.62	NA
Reactive Sulfide	ppm	-	ND	ND	ND	ND	ND	130	ND	ND	NA
Reactive Cyanide	ppm	-	ND	ND	ND	ND	ND	ND	ND	ND	NA
Total Organic Carbon	ppm	-	85000	20500	45900	6880	32000	1630	80700	4630	NA
Free Cyanide	ppm	-	ND	ND	4.0	ND	ND	ND	ND	ND	NA
Thiocyanate	ppm	-	2310	3110	10.1	31.6	15.0 L	ND	15.2	25.4	NA

NJ - Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N - Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
ND - Compound not detected.
NA - Compound not analyzed.

(Red)

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA - PROCESS PLANT AREA (OU-1)
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE

Sample Location: LB-1
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
171	39341	1.5-2.0	228	0.27	ND
221 (Dup-13)	39333	1.5-2.0	411	0.52	ND
172	39284	3.5-4.0	68.8	1.0	ND
173	39285	5.5-6.0	3.5	0.3 L	ND
174	39286	7.5-8.0	3.3	0.26 L	ND
175	39287	9.5-10.0	21.4	ND	ND

Sample Location: LB-2
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
176	39288	3.5-4.0	8.4	ND	ND
177	39289	5.5-6.0	85.4	0.21 L	ND
178	39290	7.5-8.0	4.8	ND	ND
179	39291	9.0-10.0	7.6	0.17 L	ND
222(Dup-14)	39334	9.0-10.0	5.5	0.54	ND

Sample Location: LB-3
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
180	39292	1.5-2.0	776	ND	ND
181	39293	3.5-4.0	321	0.09 L	ND
182	39294	5.5-6.0	107	0.13 L	ND
183	39295	7.5-8.0	4.7	ND	ND
184	39296	9.5-10.0	8.8	0.39 L	ND

Sample Location: LB-4
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
185	39297	1.5-2.0	15.1	ND	ND
186	39298	3.5-4.0	24.3	ND	ND
187	39299	5.5-6.0	18.8	ND	ND
188	39300	7.5-8.0	6.1	ND	ND
189	39301	9.5-10.0	5.2	0.37 L	ND

Sample Location: LB-5
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
190	39302	3.5-4.0	6.6	ND	ND
191	39303	5.5-6.0	2.0	ND	ND
192	39304	7.5-8.0	19.6 J	0.16	ND
193	39305	9.0-10.0	34.4 J	0.1 J	ND
225(Dup-17)	39337	9.0-10.0	18.3	ND	ND

Sample Location: LB-6
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
194	39306	1.5-2.0	795 J	10.7	0.49
195	39307	3.0-4.0	152 J	ND	ND
226(Dup-18)	39338	3.0-4.0	91.2	ND	ND
196	39308	5.5-6.0	76.9 J	0.28	ND
197	39309	7.5-8.0	665 J	81.7	1.5
198	39310	9.5-10.0	113 J	9.7	ND

Sample Location: LB-7
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
199	39311	1.0-2.0	33.2 J	ND	ND
201	39313	3.5-4.0	2.1 JB	ND	ND
202	39314	5.5-6.0	4.9 J	ND	ND
203	39315	7.5-8.0	1.8 JB	ND	ND
204	39316	9.0-10.0	5.4 J	0.12 J	ND
223(Dup-15)	39335	9.0-10.0	9.0	ND	ND

Sample Location: LB-8
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
205	39317	1.5-2.0	63.4 J	0.45 J	ND
224(Dup-16)	39336	1.5-2.0	64.8	1.1 J	ND
206	39318	3.5-4.0	1.4 JB	ND	ND
207	39319	5.5-6.0	5.6 J	ND	ND
208	39320	7.5-8.0	1.9 JB	ND	ND
209	39321	9.5-10.0	2.1 JB	ND	ND

Sample Location: LB-9
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
210	39322	1.0-2.0	23 J	0.3	ND
212	39324	3.5-4.0	1.4 J	0.16	ND
213	39325	5.5-6.0	6.1	0.57	ND
214	39326	7.5-8.0	551	41.5	0.61
215	39327	9.5-10.0	169	4.3	ND

Sample Location: LB-10
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
216	39328	1.5-2.0	3.7	ND	ND
217	39329	3.5-4.0	5.1	ND	ND
218	39330	5.5-6.0	1.2 J	ND	ND
219	39331	7.5-8.0	2.1	ND	ND
220	39332	9.5-10.0	2.2	ND	ND

BLANKS
Sampling Date: 31-Jan-1996

Sample ID.	Lab ID.	Depth (feet)	Total Arsenic (ppm)	Soluble Arsenic (ppm)	TCLP Arsenic (ppm)
227 (ERB)	39339	n/a	ND	NA	NA
228 (FB)	39340	n/a	ND	NA	NA

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - Analyte present. Reported value may not be accurate or precise.
B - Not detected substantially above the level reported in laboratory or field blanks.
ERB - Equipment rinsate blank.
FB - Field blank.
ND - Compound not detected.
NA - Compound not analyzed.

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TABLE 8
SUMMARY OF AIR SAMPLING ANALYTICAL DATA
HALBY CHEMICAL - SUPERFUND SITE
WILMINGTON, DELAWARE

SAMPLE	DATE	TIME COLLECTED	PUMPING RATE	ARSENIC		CHROMIUM		HEX CHROMIUM		LEAD	
				SAMPLE	AIR	SAMPLE	AIR	SAMPLE	AIR	SAMPLE	AIR
AS-1	8/29/95	0950-1250	1.5L/min	ND(0.17)	<0.0006	0.5 B	0.002	NA	---	ND(0.23)	<0.0009
Trip Blank	---	---	n/a	ND(0.17)	---	0.58 B	---	NA	---	ND(0.23)	---
AS-2	12/11/95	0930-1250	1.5L/min	ND(0.32)	<0.001	0.36 B	0.001	NA	---	ND(0.16)	<0.0005
AS-3	12/11/95	0907-1247	1.5L/min	ND(0.32)	<0.001	0.40 B	0.001	NA	---	ND(0.16)	<0.0005
Trip Blank	12/7/95	1325	n/a	ND(0.32)	---	0.28 B	---	NA	---	ND(0.16)	---
AS-4	12/11/95	1410-1645	1.5L/min	NA	---	NA	---	ND(1.0)	<0.004	NA	---
AS-5	12/11/95	1400-1700	1.5L/min	NA	---	NA	---	ND(1.0)	<0.004	NA	---
Trip Blank	12/7/95	1405	n/a	NA	---	NA	---	ND(1.0)	---	NA	---
AS-7	12/28/95	0845-1250	1.5L/min	ND(0.32)	<0.003	0.23 B	0.0006	NA	---	ND(0.16)	<0.0004
AS-8	12/28/95	1255-1525	1.5L/min	NA	---	NA	---	ND(1.0)	<0.004	NA	---
Trip Blank	12/7/95	1355	n/a	ND(0.32)	---	0.20 B	---	NA	---	ND(0.16)	---
Trip Blank	12/7/95	1415	n/a	NA	---	NA	---	ND(1.0)	---	NA	---
AS-9	1/30/96	0920-1300	1.5L/min	ND(0.32)	<0.001	0.24 B	0.0007	NA	---	ND(0.23)	<0.0007
Trip Blank	1/26/96	0900	n/a	ND(0.32)	---	0.19 B	---	NA	---	ND(0.23)	---

B - Not detected substantially above the level reported in laboratory or field blanks.
NA - Compound not analyzed.
ND - Compound not detected.
(0.32) = Detection limit.
Note: Sample concentrations are in ug/filter. Air concentrations are in ug/L.

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TABLE 9
SUMMARY OF SOIL VOLATILE ORGANIC HEADSPACE ANALYSES
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE
PAGE 1 OF 1

Sample ID:		101	111	113	114	115	116	121(DUP-5)	118	119	120	126	127	139	143 (DUP-8)	161	163
Sample Location:		TP-31	TP-7	TP-8	TP-8	TP-8	TP-11	TP-11	TP-13	TP-13	TP-18	TP-21	TP-21	TP-35	TP-35	TP-38	TP-37
Lab Sample Number:		36398	36527	36529	36530	36531	36532	36537	36534	36535	36536	36648	36649	37302	37306	39079	39081
Sampling Date:		12/13/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/14/95	12/15/95	12/15/95	12/28/95	12/28/95	1/30/96	1/30/96
Depth (feet):		30.0-3.5	4.5-5.0	3.0-3.5	7.0-7.5	7.0-7.5	3.5-4.0	3.5-4.0	5.5-6.0	11.5-12.0	5.5-6.0	8.0-8.5	11.5-12.0	5.0-5.5	5.0-5.5	7.0-7.5	8.0-8.5
Parameters	Units																
VOLATILE ORGANIC COMPOUNDS																	
Benzene	ppm	ND	ND	ND	0.9	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9	ND
Toluene	ppm	ND	ND	ND	0.8	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ppm	3.5	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8	ND	ND	ND	14.3
Xylenes (total)	ppm	ND	ND	4.8	0.6	0.5	ND	ND	0.7	ND	ND	8.4	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	ppm	ND	4.3	ND	ND	ND	5.4	3.9	3.0	0.8	94	ND	ND	45	170	ND	ND
Trichloroethene	ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.2	ND	ND	ND	ND	ND	ND
TOTAL VOLATILE ORGANIC COMPOUNDS	ppm	3.5	5.8	4.8	2.3	2.5	5.4	3.9	3.7	0.8	98.2	8.4	0.8	45	170	7.9	14.3

ND - Compound not detected

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ORIGINAL
(Red)

AR306059

TABLE 10
SUMMARY OF SOIL ANALYTICAL DATA - FIELD/TRIP/EQUIPMENT RINSATE BLANKS
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, DELAWARE
PAGE 1 OF 1

Sample ID		060	061	064	079	080	081	096	097	098	106	107	108	122	123	124	129	130	131	133	134	135	146	147	148	157	158	159	166	167	168
Sample Location:		FB	TB	Rinsate	TB	ERB	FB	FB	TB	ERB	FB	TB	ERB	FB	TB	ERB	FB	TB	ERB	FB	ERB	TB	FB	ERB	TB	FB	ERB	TB	FB	ERB	TB
Lab Sample Number:		29880	29881	29884	36186	36187	36188	36280	36281	36282	36403	36404	36405	36538	36539	36540	36651	36652	36653	36789	36790	36791	37309	37310	37311	39074	39075	39076	39084	39085	39086
Sampling Date:		8/29/95	8/29/95	8/29/95	12/11/95	12/11/95	12/11/95	12/12/95	12/8/95	12/12/95	12/13/95	12/12/95	12/13/95	12/14/95	12/13/95	12/14/95	12/15/95	12/15/95	12/15/95	12/18/95	12/18/95	12/18/95	12/28/95	12/28/95	12/28/95	1/29/96	1/29/96	1/29/96	1/30/96	1/30/96	1/25/96
Depth (feet):		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PARAMETERS	Units																														
VOLATILE COMPOUNDS *																															
Chloromethane	ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	500	ND	ND	500	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	150 J	ND	ND	130 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Confident Conc. VOAs	ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	150	ND	ND	1130	ND	ND	500	ND	ND	ND	ND	ND	ND	ND	ND
Tentatively Identified Compounds (TICs)																															
Unknown Siloxane	ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	990 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	870 R	9 R	25 R
Total TICs	ppb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILE COMPOUNDS																															
4-Chloro-3-Methylphenol	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	0.1 J	NA	ND	ND	NA
1,4-Dichlorobenzene	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	0.1 J	NA	ND	ND	NA
bis(2-Ethylhexyl)phthalate	ppb	ND	NA	1 JB	NA	ND	1 B	0.8 B	NA	0.6 B	ND	NA	ND	ND	NA	ND	ND	NA	1 J	ND	ND	NA	ND	ND	NA	1 J	1 J	NA	ND	8 J	NA
Total Confident Conc. BNAs	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	1	ND	ND	NA	ND	ND	NA	1	1.2	NA	ND	8	NA
Tentatively Identified Compounds																															
2-Pentanone,4-hyroxy-4 Methyl	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	5 R	3 R	NA	3 R	6 R	NA
Unknown	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	2 J	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Total TICs	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	2	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
TCL PESTICIDES/PCBs	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
METALS																															
Aluminum	ppb	208	NA	85.1 J	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Antimony	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	9.5	NA
Cadmium	ppb	0.46 B	NA	0.31 B	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Calcium	ppb	417	NA	192	NA	ND	99.8 B	261	NA	134 J	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Copper	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	2.7 B	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Iron	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Lead	ppb	6.1	NA	2.4 L	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Magnesium	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Nickel	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	1.2 J	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Potassium	ppb	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	418	397	NA
Sodium	ppb	ND	NA	ND	NA	319 B	305 B	ND	NA	426 B	370 B	NA	ND	388 B	NA	486 B	363 B	NA	473 B	304 B	ND	NA	371 B	422 B	NA	262 B	328 B	NA	ND	ND	NA
Thallium	ppb	ND	NA	5.3 J	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Zinc	ppb	4.0 J	NA	5.8 J	NA	5.5	7.1	14.3	NA	14.3	9.4	NA	9.1	6.9 B	NA	3.7 B	2.7 J	NA	3.8 J	ND	3.4 J	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
WET CHEMISTRY TESTS																															
Free Cyanide	ppm	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA
Thiocyanate	ppm	ND	NA	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	ND	NA	ND	ND	NA	ND	ND	NA	ND	ND	NA

B - Not detected substantially above the level reported in laboratory or field blanks. Not included in totals.
J - Analyte present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
R - Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. Not included in totals.
ND - Compound not detected.
NA - Compound not analyzed.

blank.xls

TABLE EPA-1
SUMMARY OF USEPA SOIL PILE SAMPLING ANALYTICAL RESULTS
HALBY CHEMICAL SITE
WILMINGTON, DELAWARE

Sample Location		HC-A	HC-A	HC-B	HC-C
Sample Depth (ft)		-----	-----	-----	-----
Laboratory Sample Number		9506130-01A	9506130-01A	9506130-02A	9516031-03A
Sample Date		6/12/95	6/12/95	6/13/95	6/12/95
Parameters	***Units***	Dilution = 1	Dilution = 5	Dilution = 5	Dilution = 5
TCL VOLATILE ORGANIC COMPOUNDS					
Acetone	ppm	0.290 B	1.45 B	0.751 B	0.888 B
Carbon Disulfide	ppm	7,720.0 &	7,720.0 &	13,300.0 &	5,120.0 $
Chloroform	ppm	ND	ND	0.0136 J	ND
Trichloroethene (TCE)	ppm	0.00358 J	0.0179 J	0.0527	0.0319 J
Benzene	ppm	0.151	0.756	0.0829	0.0669
Tetrachloroethene (PCE)	ppm	0.0292	0.146	18.1 !	0.0823
Toluene	ppm	0.0976	0.488	0.0501	0.0452 J
Ethyl benzene	ppm	0.0213	0.106	0.0131 J	ND
Xylenes (total)	ppm	0.0994	0.497	0.0543	0.0396 J
TOTAL VOLATILE ORGANICS	*ppm*	*7,720.402*	*7,722.011*	*13,318.367*	*5,120.266*
TCL SEMIVOLATILE ORGANIC COMPOUNDS					
Naphthalene	ppm	NA	0.526 J	1.03 J	ND
2-Methylnaphthalene	ppm	NA	0.601 J	3.67 J	ND
Phenanthrene	ppm	NA	1.08 J	2.28 J	ND
Fluoranthene	ppm	NA	0.759 J	1.85 J	ND
Pyrene	ppm	NA	0.86 J	2.13 J	ND
Bis (2-ethylhexyl) phthalate	ppm	NA	ND	8.62	ND
TOTAL SEMIVOLATILE ORGANICS	*ppm*	NA	*3.826*	*19.58*	*ND*

Note: The semivolatile analysis of sample HC-B was performed at a dilution factor of 10.

ORIGINAL
(Red)

TABLE EPA-1 (cont'd)
SUMMARY OF USEPA SOIL PILE SAMPLING ANALYTICAL RESULTS
HALBY CHEMICAL SITE
WILMINGTON, DELAWARE

Sample Location		HC-A	HC-B	HC-C
Sample Depth (ft)		-----	-----	-----
Laboratory Sample Number		9506130-01A	9506130-02A	9516031-03A
Sample Date		6/12/95	6/13/95	6/12/95
Parameters	***Units***	Dilution=10	Dilution=10	Dilution=10
TCL PESTICIDES				
Dieldrin	ppm	0.0197	ND	ND
TCL PCBs	ppm	ND	ND	ND
TAL METALS				
Aluminum	ppm	4,370.0	2,230.0	9,300.0
Antimony	ppm	5.47	4.53	0.694
Arsenic	ppm	2,000.0	30,900.0	2,220.0
Barium	ppm	126.0	95.1	62.0
Cadmium	ppm	62.1	7.48	ND
Calcium	ppm	3,630.0	930.0	373.0
Chromium	ppm	49.9	31.1	29.5
Cobalt	ppm	48.7	58.5	ND
Copper	ppm	2,650.0	17,700.0	ND
Iron	ppm	24,900.0	6,350.0	13,800.0
Lead	ppm	254.0	172.0	16.0
Magnesium	ppm	2,000.0	407.0	2,100.0
Manganese	ppm	1,840.0	110.0	91.3
Mercury	ppm	9.2	24.3	ND
Nickel	ppm	21.5	27.5	21.3
Potassium	ppm	444.0	270.0	565.0
Silver	ppm	ND	ND	0.211
Sodium	ppm	9,220.0	247.0	3,240.0
Zinc	ppm	31,000.0	3,540.0	43.2
MISCELLANEOUS				
Cyanide (total)	ppm	5.45	23.8	4.43
Sulfide	ppm	1,200,000.0	814,000.0	609,000.0
Reactive Cyanide	ppm	1.23	0.038	0.210
Reactive Sulfide	ppm	14,300.0	11,200.0	11,400.0
Percent Solids	%	66.8	73.1	39.6
Water Content	%	43.2	26.9	61.4
pH	std. units	9.93	6.63	6.86
Total Organic Carbon	ppm	26,700.0	23,100.0	18,000.0
Flash Point	deg. C	N	N	N

B= Found in method blank. Indicates laboratory contamination.

J= An estimated value, found below the method detection limit.

N= Flash point not observed; heated to 100 ° C

!= Value obtained from a 1:6250 dilution. *$= Value obtained from a 1:12500 dilution.*

&= Value obtained from a 1:62500 dilution. *ND= Not detected*

TCL= Target Compound List *TAL= Target Analyte List*

Notes:

1. *Sample HC-A collected from soil excavated directly from sump.*
2. *Samples HC-B and HC-C collected from soil excavated from sump exterior.*

ORIGINAL

TABLE EPA-2
SUMMARY OF USEPA SOIL PILE SAMPLING ANALYTICAL RESULTS
HALBY CHEMICAL SITE
WILMINGTON, DELAWARE

Sample Location			HC-31
Sample Depth (ft)		Federal Hazardous	-----
Laboratory Sample Number		Waste Characteristic	9505212-01A
Sample Date		Regulatory Levels	5/30/95
Parameters	***Units***		***Q***
TCLP VOLATILE ORGANIC COMPOUNDS			
Benzene	mg/l	0.5	0.0965 J
TOTAL TCLP VOLATILE ORGANICS	*mg/l*		*0.0965*
TCLP SEMIVOLATILE ORGANIC COMPOUNDS	mg/l	----	ND
TCLP PESTICIDES			
Silvex	mg/l	1.0	0.0006 J
TCLP PCBs	mg/l	----	ND
TCLP METALS			
Barium	mg/l	100	0.806
Chromium	mg/l	5.0	0.178
CARBON DISULFIDE	ppm	----	317.0
MISCELLANEOUS			
Cyanide (total)	ppm	----	16.1
Sulfide	ppm	----	195,000.0
Reactive Cyanide	ppm	250	0.103
Reactive Sulfide	ppm	500	2,820.0
Extractable Organic Halides	ppm	----	ND
Paint Filter Test	ml/g	----	ND
Percent Solids	%	----	84.5
pH	std. units	<=2 or >=12.5	9.12
Flash Point	deg. C		N

J= An estimated value, found below the method detection limit.

N= Flash point not observed; heated to 100 ° C

ND= Not detected

TCLP= Toxicity Characteristic Leaching Procedure

Note:

1. *Sample HC-31 collected from sump solids.*

TABLE EPA-3

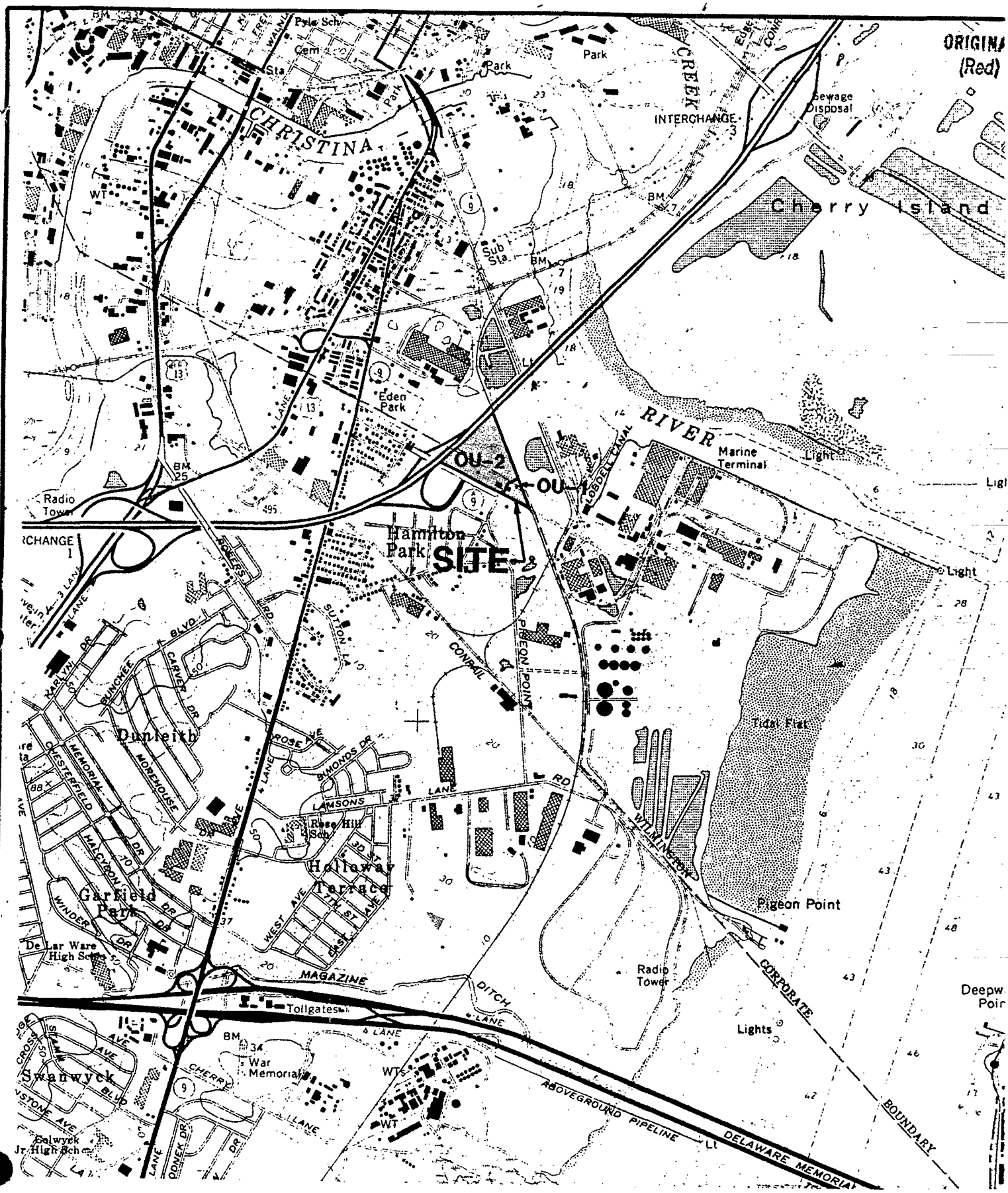
HALBY CHEMICAL "DITCH"

(PRELIMINARY RESULTS)

LOCATION	REACTIVE SULFIDE	AMMONIA	ARSENIC	ZINC	CARBON DISULFIDE
HAS-1A	ND	540	192	251	2.4
HAS-1B	ND	94.4	959	40.2	7
HAS-1C	ND	200	148	23	28
HAS-2A	ND	140	924	2560	8600
HAS-2B	3,440	1360	851	6100	6600
HAS-3A *	ND	230	340	968	41,000
HAS-3B	ND	590	3590	255	8800
HAS-4A	ND	PH<7	4470	1440	16,000
HAS-4B	ND	PH<7	114	72.1	8600
HAS-5A	ND	PH<7	3.7	15.1	140
HAS-5B *	42,000	8900	4260	81,300	98,000
HAS-6A	2,500	1280	1010	30,600	730
HAS-6B	ND	290	1520	134	290
HAS-6D	ND	440	3280	136	400
HAS-7A	ND	PH<7	265	198	9.9
HAS-7B	350	410	111	706	14
HAS-8A	ND	PH<7	312	723	5
HAS-8B	950	840	179	847	54
HAS-9	ND	PH<7	1.7	28	0.8
HRS-1 (RINSATE)	ND	PH<7	ND	ND	0.6

* = IGNITABLE AT 71.6 DEGREES F
ALL RESULTS MG/KG

FIGURES



E.: WILMINGTON SOUTH, DEL.–N.J. U.S.G.S. QUADRANGLE MAP, 1987

OU-1 OPERABLE UNIT 1
OU-2 OPERABLE UNIT 2

Langan
Engineering and Environmental Services, Inc.

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HALBY CHEMICAL SITE
SITE LOCATION MAP

WILMINGTON DELAWA

PRO. 2061601

AR 306065

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DATE OF DOCUMENT 6/28/96
DESCRIPTION OF IMAGERY Site Plan and Topographic Map- figure No. 2
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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DATE OF DOCUMENT 4/28/96
DESCRIPTION OF IMAGERY Recent 1995-1996 Soil Sampling Results Volatile Organic Compounds - Figure 3
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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DESCRIPTION OF IMAGERY Recent 1995-1996 Soil Sampling Results Base Neutral Compounds - Figure 4
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DESCRIPTION OF IMAGERY Recent 1995-1996 Soil Sampling Results Pesticides, Herbicides and PCB's - figure 5
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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DESCRIPTION OF IMAGERY Recent 1995-1996 Soil Sampling Results Metals and Cyanide Compounds - figure 6
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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REPORT OR DOCUMENT TITLE Response Action Report
DATE OF DOCUMENT 6/28/96
DESCRIPTION OF IMAGERY Recent 1995-1996 Soil Sampling Results Carbon Disulfide - figure 7
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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REPORT OR DOCUMENT TITLE Response Action Report
DATE OF DOCUMENT 00
DESCRIPTION OF IMAGERY Historical and Recent 1995-1996 Sediment/Soil Carbon Disulfide Sampling Results - figure 8
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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REPORT OR DOCUMENT TITLE Response Action Report
DATE OF DOCUMENT 6/28/96
DESCRIPTION OF IMAGERY Historical and Recent 1995-1996 Sediment/Soil Arsenic Sampling Results - figure 9
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

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REPORT OR DOCUMENT TITLE Response Action Report
DATE OF DOCUMENT 6/28/96
DESCRIPTION OF IMAGERY Recent 1995-1996 Soil Sampling Results Total, Soluble and TCLP Arsenic - figure 10
NUMBER AND TYPE OF IMAGERY ITEM(S) Image

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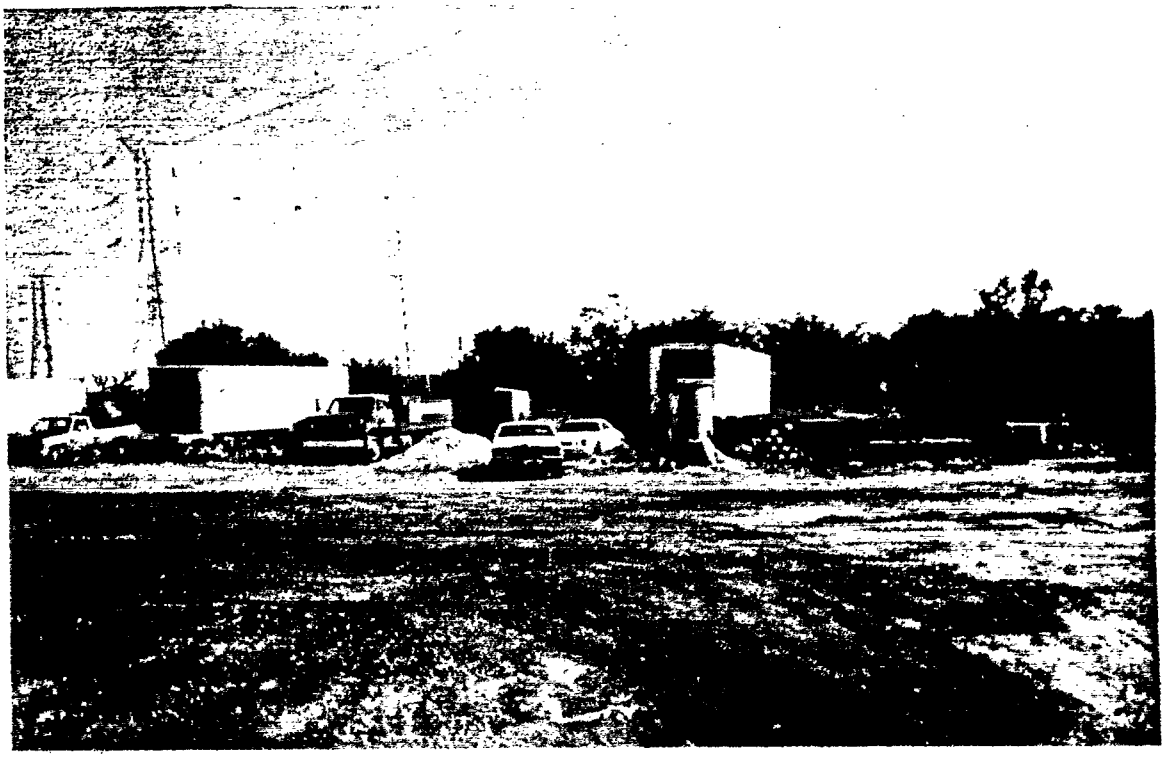
SECTION/BOX/FOLDER AR reading room

REPORT OR DOCUMENT TITLE Response Action Report
DATE OF DOCUMENT 6/28/96
DESCRIPTION OF IMAGERY Site Security Fence and Stormwater Control - figure 11
NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map

APPENDIX A
PHOTOGRAPHS

SITE CONDITIONS PRIOR TO IMPLEMENTATION OF THE RESPONSE ACTION PLAN



Drainage Ditch Area Looking Northeast (16 August 1995)

Drainage Ditch Area Looking East (16 August 1995)

SITE CONDITIONS PRIOR TO IMPLEMENTATION OF THE RESPONSE ACTION PLAN

ORIGINAL (Red)

Drainage Ditch Looking North From South End (16 August 1995)

Drainage Ditch Area Looking North From South End (16 August 1995)

INSTALLATION OF SITE SECURITY FENCE

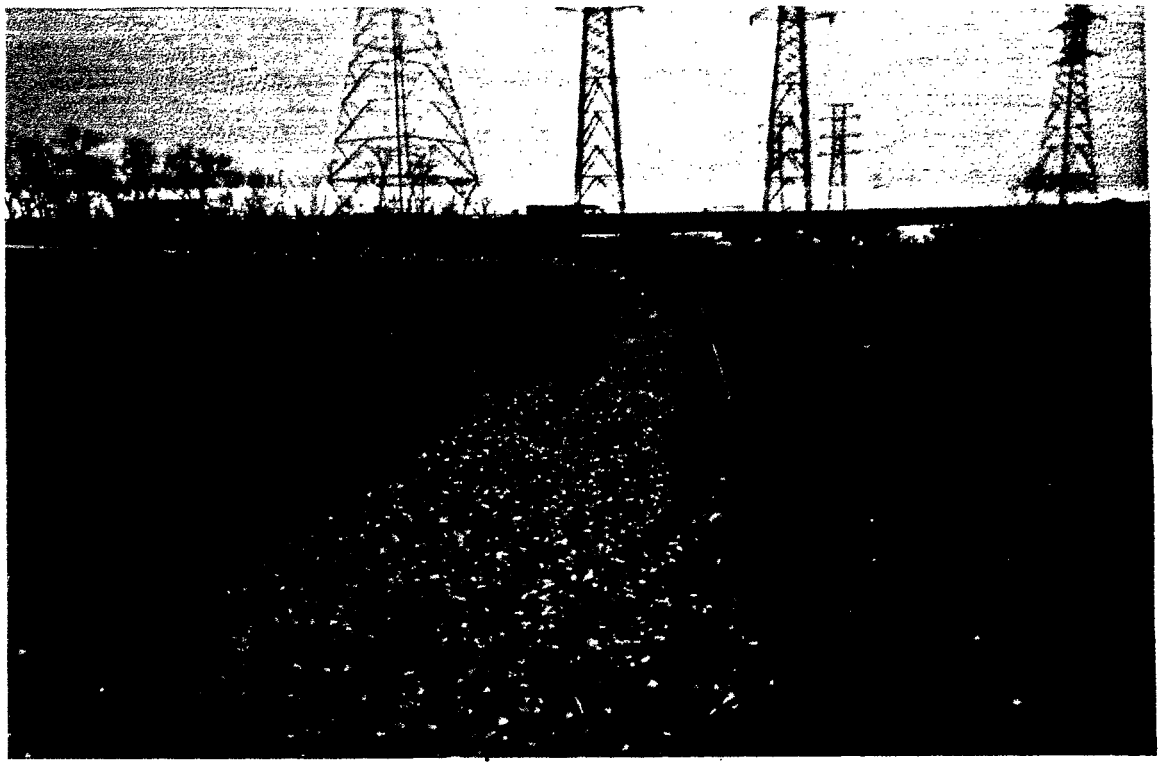
ORIGINAL
(Red)

Drainage Ditch Area Security Fence Looking Northeast (August 1995)

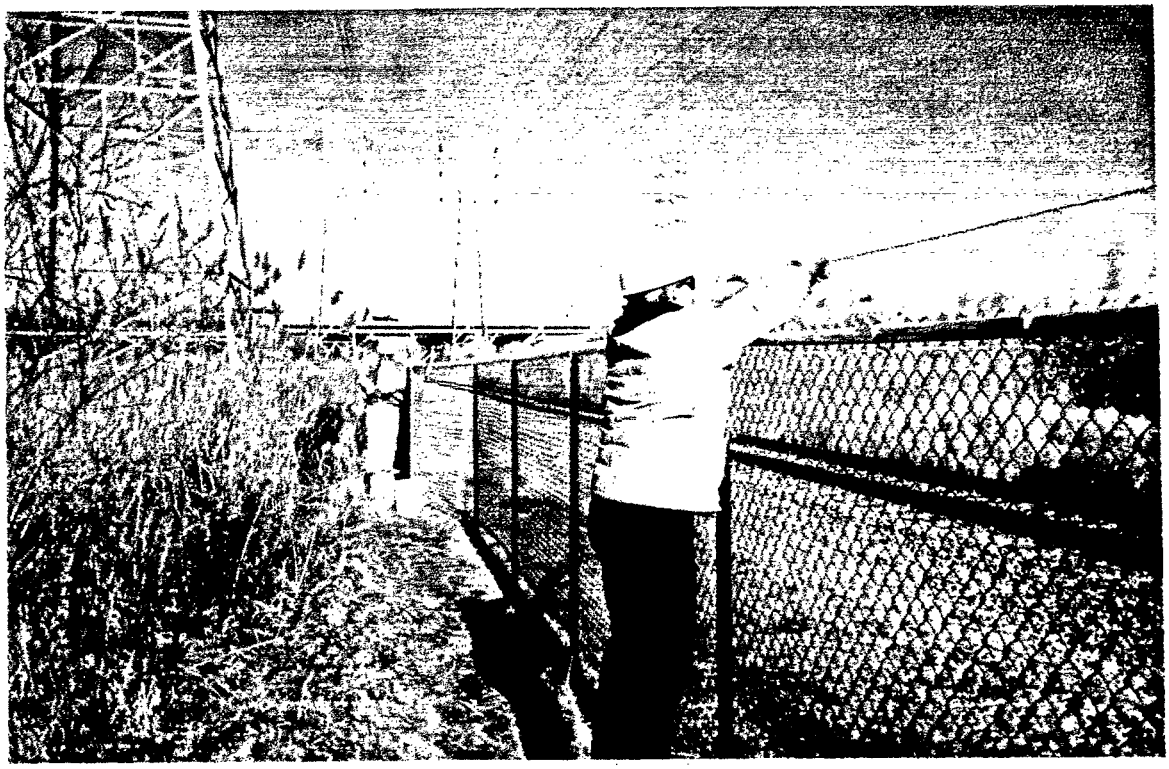
Warning Sign on South Gate of Drainage Ditch Area Fence (October 1995)

INSTALLATION OF SITE SECURITY FENCE

ORIGINAL (Red)

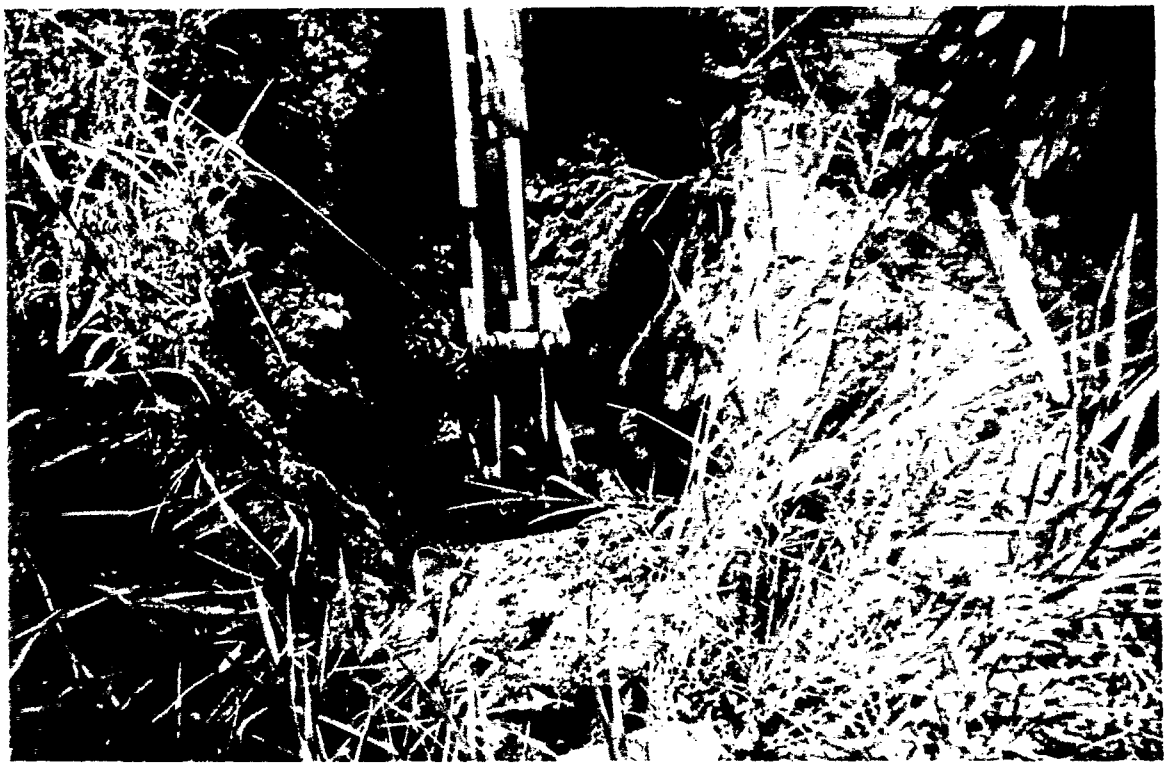


Installation of Security Fence to I-495 Embankment (December 1995)



Installation of Barbed Wire on Top of Fence (December 1995)

Measuring Test Pit TP-2 (29 August 1995)



Excavating Test Pit TP-3 (29 August 1995)

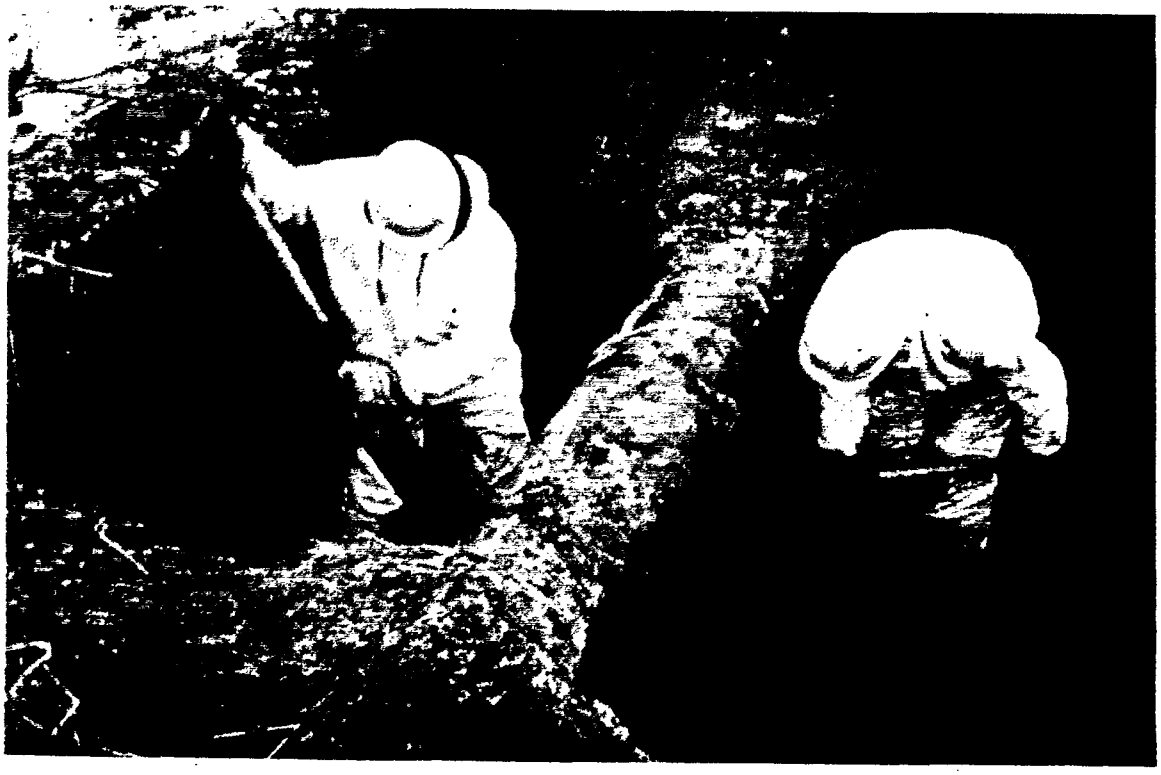
INVESTIGATION OF WATER MAIN - FIRST EVENT

Excavating Test Pit TP-5 (29 August 1995)

Sampling Test Pit TP-6 (29 August 1995)

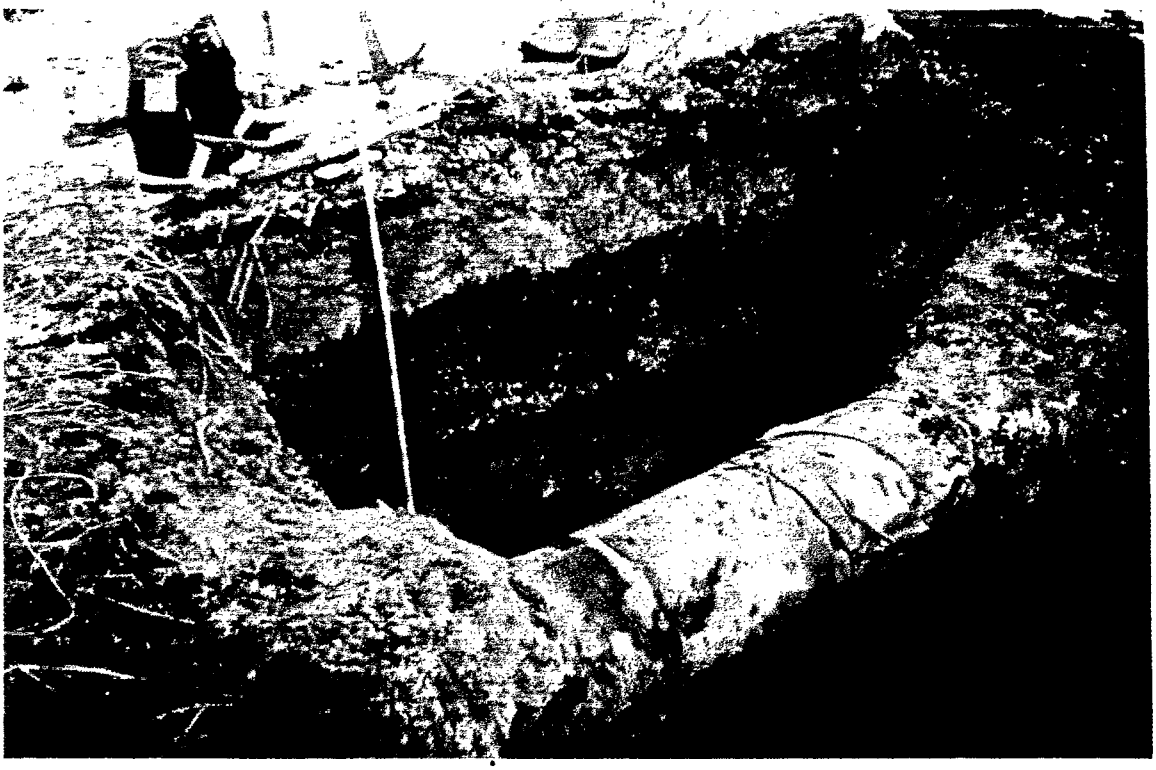
INVESTIGATION OF WATER MAIN - SECOND EVENT

Sampling Test Pit TP-28 (11 December 1995)



Excavating the Water Main at Test Pit TP-30 (13 December 1995)

INVESTIGATION OF WATER MAIN - SECOND EVENT



Water Main Exposed at Test Pit TP-31 (13 December 1995)

Collecting Groundwater Sample From Test Pit TP-31 (13 December 1995)

INVESTIGATION OF WATER MAIN - SECOND EVENT

Ultrasonic Thickness Testing of the Water Main at Test Pit TP-31 (13 December 1995)

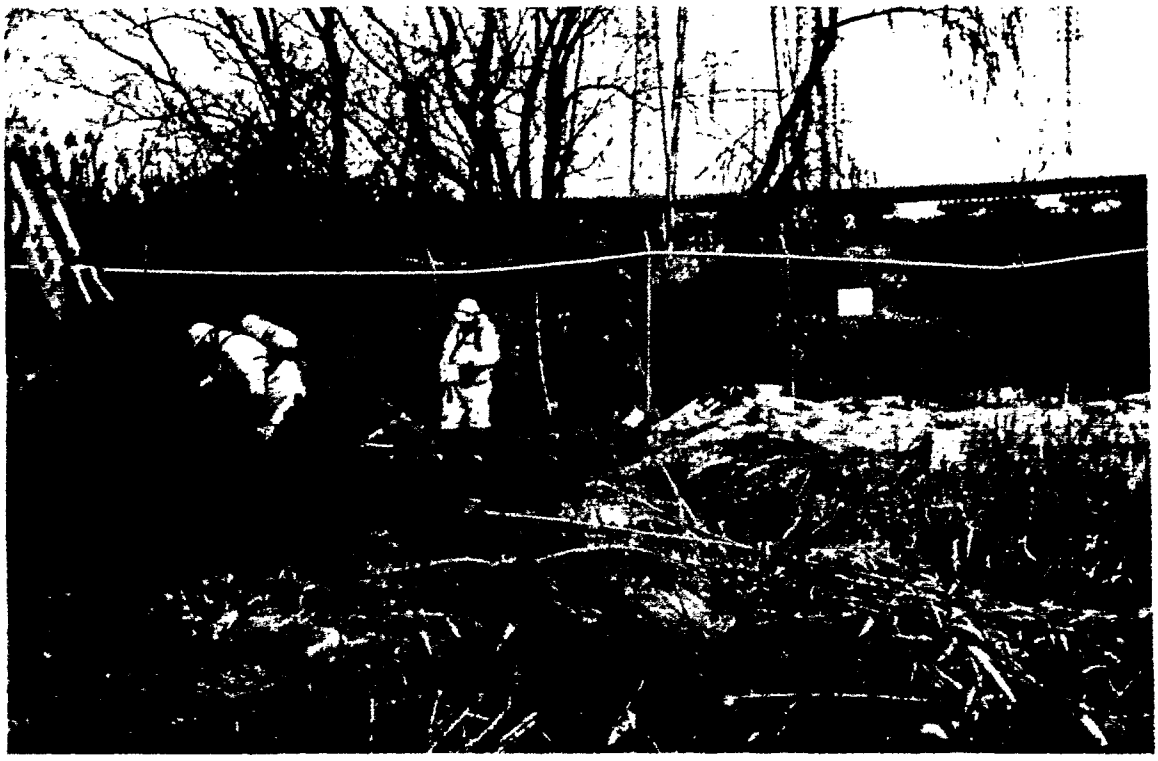
Protective Coating of Water Main Repaired at Test Pit TP-30 Prior to Backfilling (13 December 1995)

DRAINAGE DITCH DELINEATION

Excavating Test Pit TP-11 (14 December 1995)

Sampling Test Pit TP-18, Note Debris (14 December 1995)

DRAINAGE DITCH DELINEATION

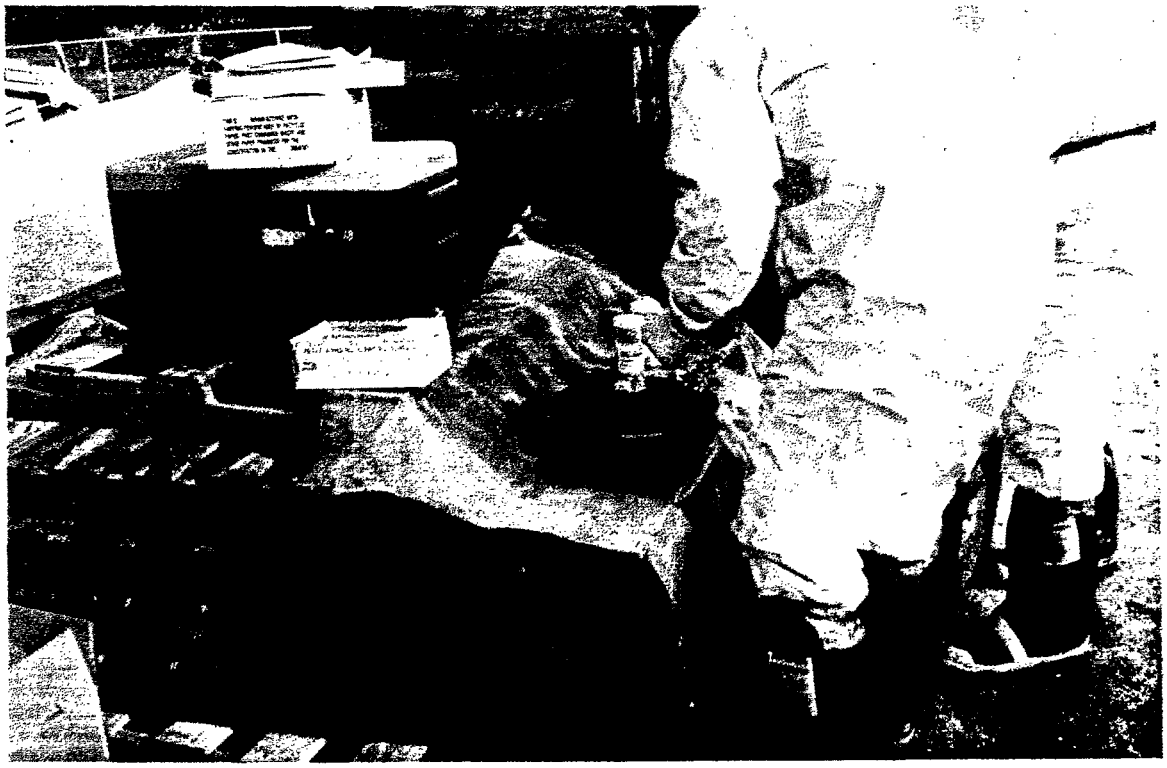


Excavating Test Pit TP-23, Note Level B PPE (18 December 1995)

Excavating Test Pit TP-36, Note Debris (28 December 1995)

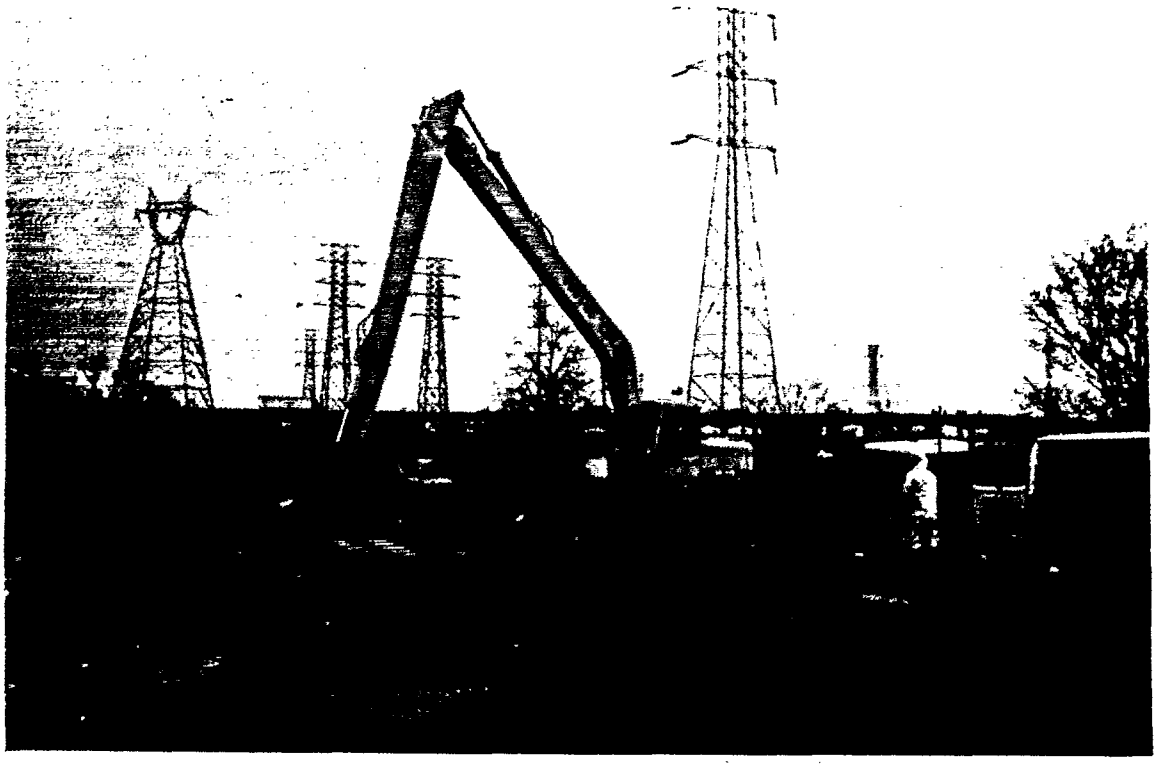
SUMP AREA DELINEATION

West Sidewall of Test Pit TP-25, Note That Orange-Brown Soil is USEPA Backfill (12 December 1995)

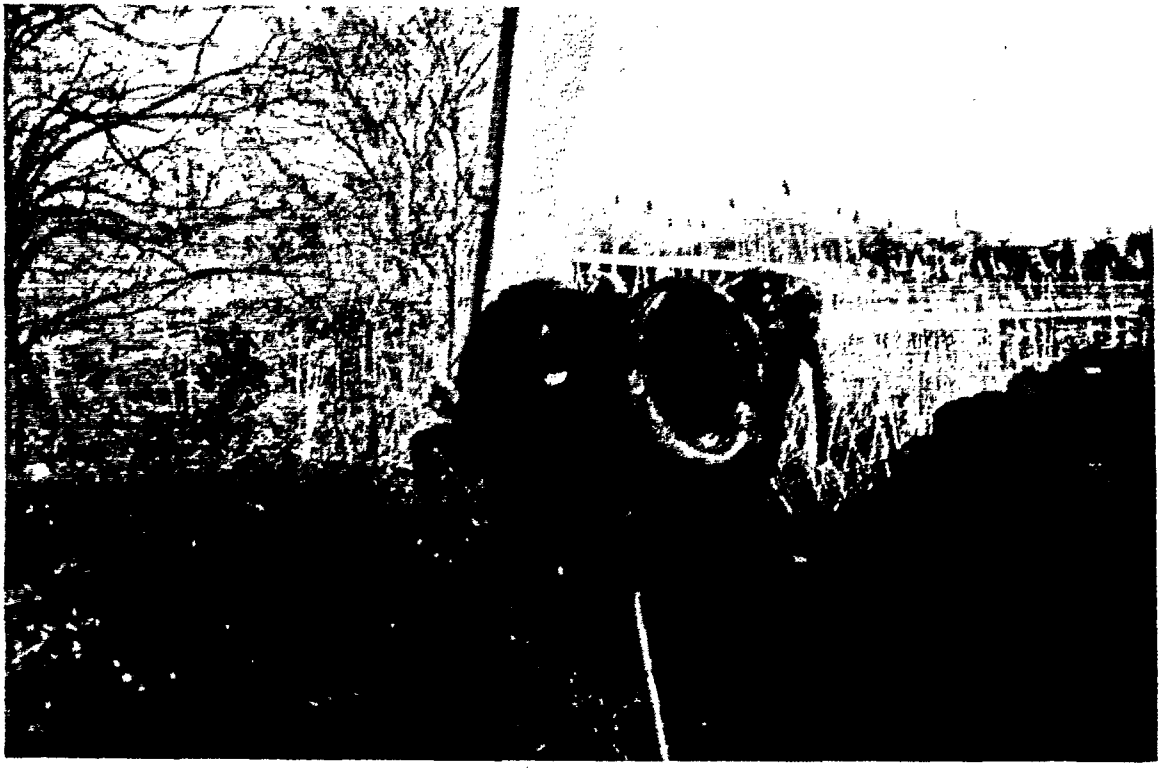


Preparing USEPA Split Sample From Test Pit TP-25 (12 December 1995)

DRAINAGE DITCH DELINEATION



Extended Reach Backhoe Used to Excavate Test Pits TP-37 Through TP-41 (January 1996)

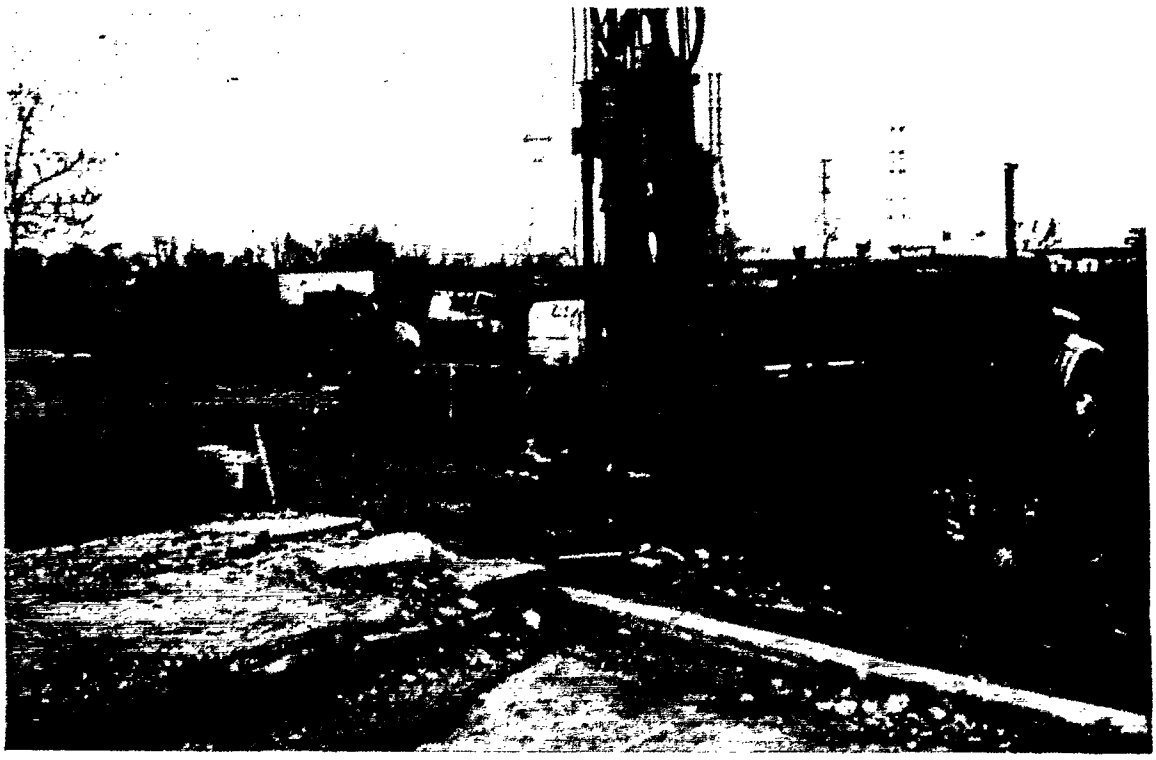


Debris Excavated From Test Pit TP-39 (29 January 1996)

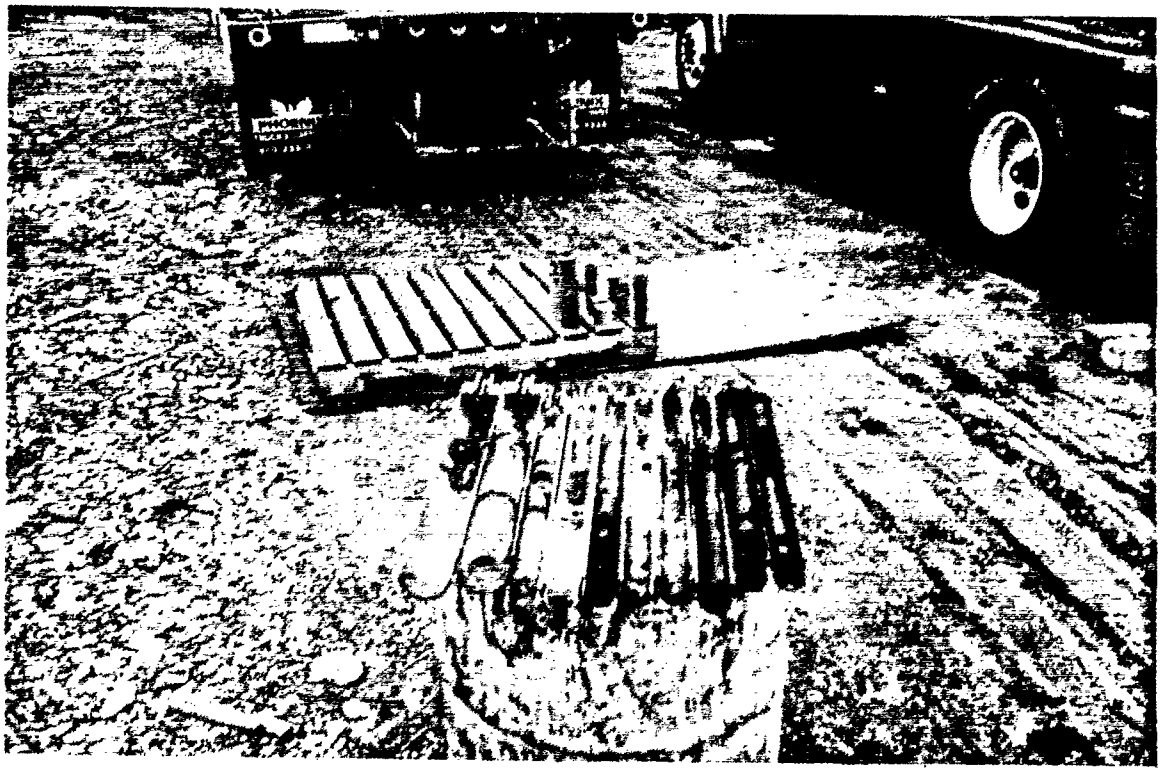
Backfilling Breach in Lagoon Bank (21 December 1995)

Completed Berm Across Breach in Lagoon Bank (22 December 1995)

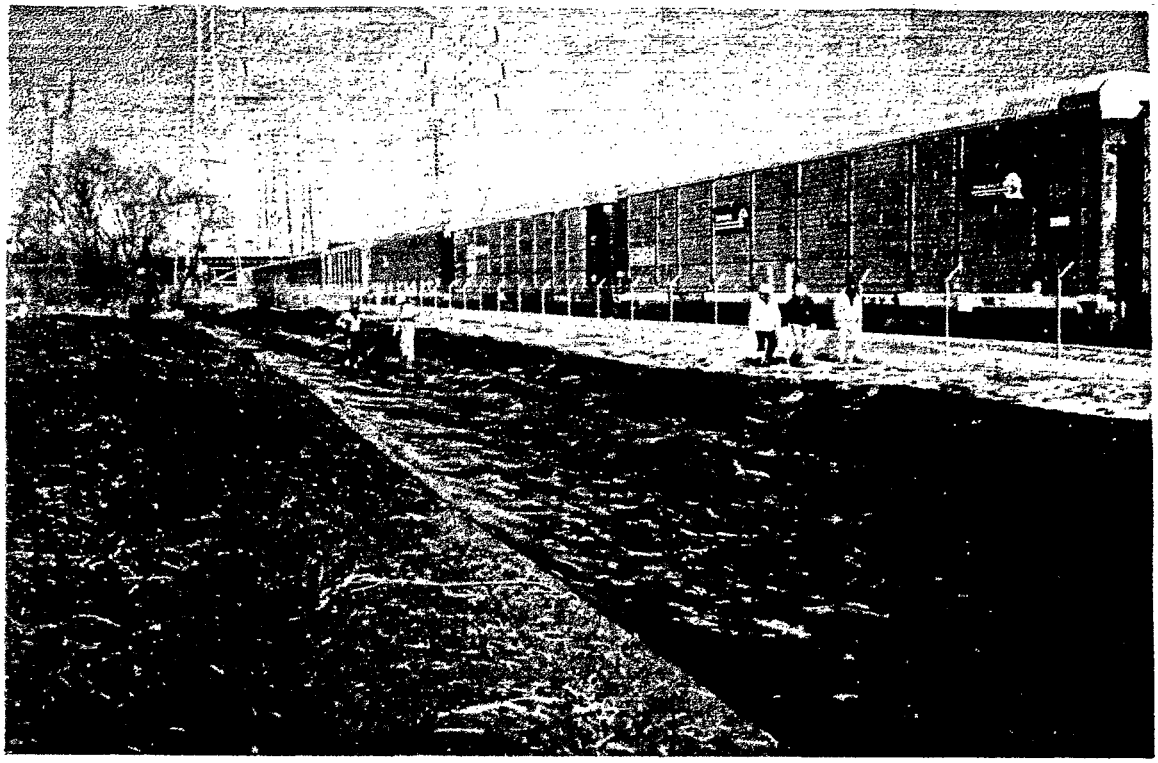
PROCESS PLANT AREA SOIL BORINGS



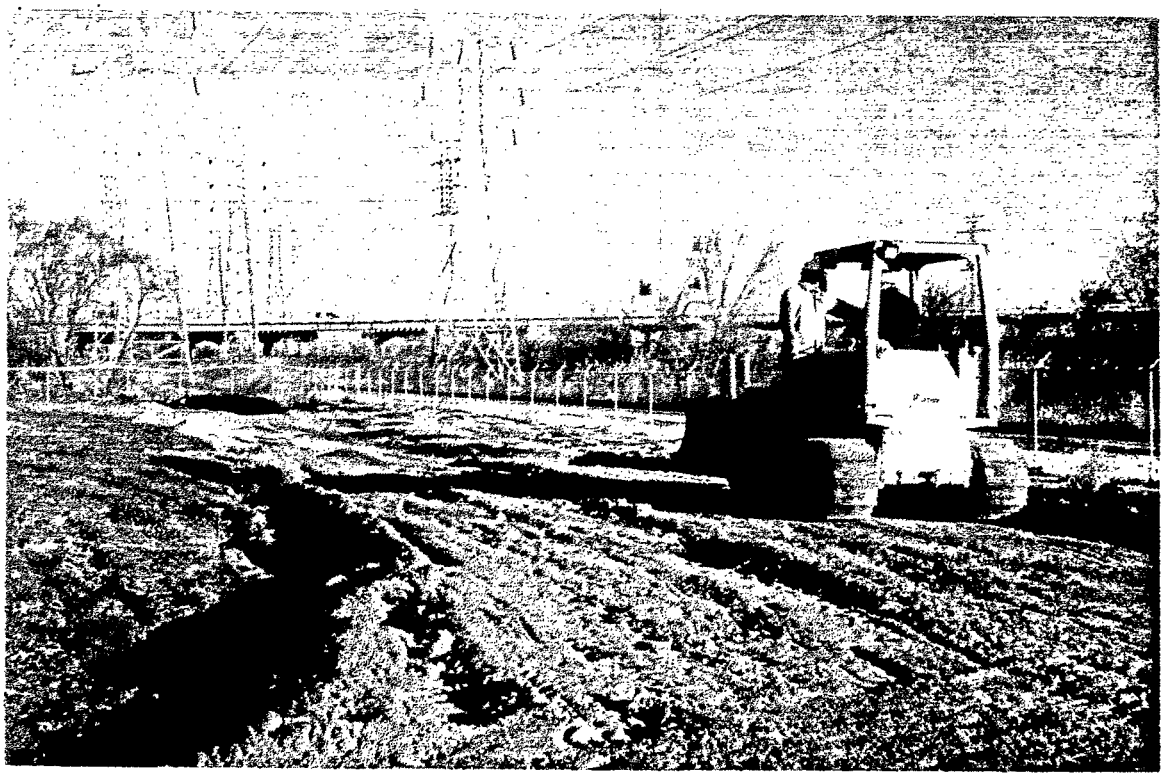
Augering at Boring LB-2 (31 January 1996)



Soil Recovered From Boring LB-9, Deeper From Left to Right (31 January 1996)



Placing HDPE Liner Over Drainage Ditch (28 December 1995)



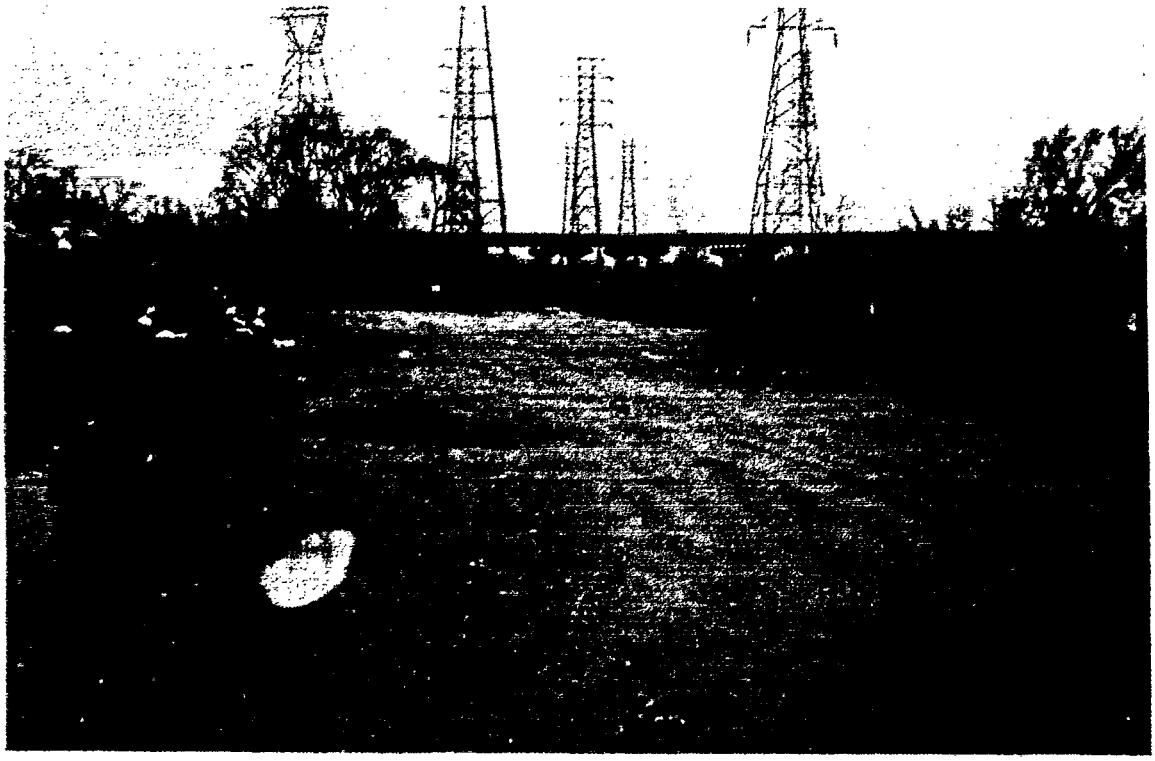
Placing Clean Fill Over HDPE Liner (29 December 1995)

TRANSFER OF SOIL PILES FROM THE PROCESS PLANT AREA TO THE DRAINAGE DITCH AREA

Placing Excavated Soil on HDPE Liner in Drainage Ditch Area (2 January 1996)

Covered and Secured Soil Pile (April 1996)

SITE CONDITIONS FOLLOWING IMPLEMENTATION OF THE RESPONSE ACTION PLAN



Drainage Ditch Area Looking North From South End (22 February 1996)

Drainage Ditch Area Looking Northwest, Taken During Treatability Study Sample Collection (2 April 1996)

ORIGINAL
(Red)

APPENDIX B
TEST BORING LOGS AND TEST PIT LOGS

LOG OF BORING NO: LB-1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~10 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	11 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
							START: 08:40
	1	1	3" SS	0.85	7 4 7 8	Gray-brown silty coarse to fine SAND, some medium to fine gravel, trace clay (moist to wet)	Boring relocated about 12' west of proposed location.
	2						Environmental soil sample LB-1-171 collected from 1.5' to 2' at 9:05.
	3	2	2" SS	0.35	3 2	Dark gray to brown silty coarse to fine SAND, trace fine gravel, trace clay (wet)	Soil is very soft and wet, getting poor recovery. Auger to 3' and try again.
	4	3	2" SS	0.9	3 5 7 5	Light gray coarse to fine SAND, trace to some silt, trace medium to fine gravel (moist)	PID=0 ppm from surface to 5'. Environmental soil sample LB-1-172 collected from 3.5' to 4.5' at 9:25. Extra sample required, poor recovery. PID=1 ppm from 5' to 6'. Slight odor noted.
	5						
	6	4	3" SS	1.6	4 12 17 18	Dark gray to black fine SAND, trace to some silt (moist)	Environmental soil sample LB-1-173 collected from 5.5' to 6' at 9:30.
	7						
	8	5	2" SS	2.0	3 6 9 8	Light gray SILT, some fine sand (moist)	PID=0 ppm at 7.5'. Slight odor noted. Environmental soil sample LB-1-174 collected from 7.5' to 8' at 9:40.
	9						
	10	6	2" SS	1.6	14 14 11 6	Black fine SAND, trace silt (moist)	Strong odor noted in black sand. PID may not be working. Environmental soil sample LB-1-175 collected from 9.5' to 10' at 9:43.
	11						
	12					BOTTOM OF BORING @ 11'	STOP: 09:45

Notes:
1. Duplicate sample DUP-13-221 collected at sample LB-1-171 location.

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-2

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~10 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches | Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
						Gray-brown fine SAND, some silt (moist)	START: 10:10
	1	---	---	---	—	Concrete DEBRIS	Encounter concrete debris and rubble at 6" depth, auger to 2'.
	2				---		No soil sample collected from 1.5' to 2', only debris present.
	3	1	2" SS	1.4	4 6	Dark gray to black SILT and fine SAND, trace medium sand, trace clay (moist)	PID=0 ppm for entire boring. Slight odor noted at 4'.
	4				6 4		Environmental soil sample LB-2-176 collected from 3.5' to 4' at 10:25.
	5	2	2" SS	1.6	2 4	Black SILT and fine SAND, trace clay (moist)	Slight odor noted.
	6				5 4		Environmental soil sample LB-2-177 collected from 5.5' to 6' at 10:30.
	7	3	2" SS	1.9	7 6	Black SILT and fine SAND, trace clay (moist)	
	8				7 5		Environmental soil sample LB-2-178 collected from 7.5' to 8' at 10:35.
	9	4	2" SS	2.0	3 3	Black SILT and fine SAND, trace clay (moist)	
	10				4 6		Environmental soil sample LB-2-179 collected from 9' to 10' at 10:40. Extra volume needed for duplicate sample.
	11					BOTTOM OF BORING @ 10'	STOP: 10:35
	12						Notes: 1. Duplicate sample DUP-14-222 collected at sample location LB-2-179. 2. CS2 Draeger tubes<3 ppm.

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River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-3

Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~10 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
	1	1	3" SS	1.9	6 8	Gray-brown to orange-brown silt, some clay, trace fine sand (moist)	START: 11:05 PID=0 ppm.
	2				5 8		Environmental soil sample LB-3-180 collected from 1.5' to 2' at 11:30.
	3	2	2" SS	1.7	3 4		PID=0 ppm.
	4				4 4	Orange-brown fine SAND, some silt (moist)	Environmental soil sample LB-3-181 collected from 3.5' to 4' at 11:35.
	5	3	2" SS	1.6	7 10	Orange-brown fine SAND, some silt, trace clay (moist)	PID=0 ppm. Black silt and sand starts at 5.4' depth.
	6				13 10	Black silty fine SAND (moist)	Environmental soil sample LB-3-182 collected from 5.5' to 6' at 11:36.
	7	4	2" SS	1.6	7 6		Slight odor in black silt. PID=2 ppm.
	8				12 11	Black SILT, some fine sand (moist)	Environmental soil sample LB-3-183 collected from 7.5' to 8' at 11:40.
	9	5	2" SS	2.0	8 8	Black fine sandy SILT (moist)	Slight odor in black silt. PID=0 ppm.
	10				10 8		Environmental soil sample LB-3-184 collected from 9.5' to 10' at 11:42.
	11					BOTTOM OF BORING @ 10'	STOP: 11:30
	12						

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-4 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~12 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches | Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
	1	1	3" SS	1.5	6 7 10 7	Gray-brown to orange-brown silty fine SAND, trace clay (moist)	START: 16:30 PID=0 ppm for entire boring. Environmental soil sample LB-4-185 collected from 1.5' to 2' at 16:45.
	2						
	3	2	2" SS	1.8	6 7 11 8	Orange-brown fine SAND, trace to some silt (moist)	Environmental soil sample LB-4-186 collected from 3.5' to 4' at 16:48.
	4						
	5	3	2" SS	1.5	8 7 11 13	Orange-brown to gray-brown fine SAND, trace to some silt (moist)	Environmental soil sample LB-4-187 collected from 5.5' to 6' at 16:51.
	6						
	7	4	2" SS	1.6	12 16 20 15	Orange-brown to gray-brown fine SAND, trace to some silt (moist) Black fine sandy SILT (moist)	Environmental soil sample LB-4-188 collected from 7.5' to 8' at 16:58.
	8						
	9	5	2" SS	1.5	14 18 22 24	Mottled light gray and orange-brown SILT, trace fine sand, trace clay (moist) Black sandy SILT (moist)	Environmental soil sample LB-4-189 collected from 9.5' to 10' at 17:03.
	10						
	11					BOTTOM OF BORING @ 10'	STOP: 17:05
	12						

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-5

Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~11.5 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
	1	---	---	---	---	Concrete DEBRIS	START: 14:52 Boring relocated about 5' south of proposed location. Auger through about 2' of concrete debris. No sample collected from upper 2' of soil. PID=0 ppm for entire boring.
	2				---		
	3	1	2" SS	1.9	5 4	Orange-brown to gray-brown fine SAND, trace to some silt (moist)	
	4				4 3		Environmental soil sample LB-5-190 collected from 3.5' to 4' at 15:35.
	5	2	2" SS	1.9	6 4	Medium-gray to black fine SAND, some silt (moist)	Soil changes to black sand and silt at 4.5'.
	6				3 5		Environmental soil sample LB-5-191 collected from 5.5' to 6' at 15:37.
	7	3	2" SS	1.5	7 8	Black fine SAND, some silt (moist to wet)	
	8				8 10		Environmental soil sample LB-5-192 collected from 7.5' to 8' at 15:40.
	9	4	2" SS	1.9	8 7	Black fine SAND, some silt (moist to wet)	
	10				10 14		Environmental soil sample LB-5-193 collected from 9' to 10' at 15:44. Extra volume required for duplicate.
	11					BOTTOM OF BORING @ 10'	STOP: 15:45 Notes: 1. Duplicate sample DUP-17-225 collected at sample location LB-5-193.
	12						

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-6

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~11.5 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches | Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
	1	1	3" SS	0.4	3 4	Brown coarse to fine SAND, some silt, trace medium to fine gravel (moist)	START: 15:55 PID=0 ppm for entire boring.
	2				5 3		Environmental soil sample LB-6-194 collected from 1.5' to 2' at 16:05.
	3	2	2" SS	1.6	2 1	Orange-brown fine SAND, trace silt (moist)	
	4				1 2		Environmental soil sample LB-6-195 collected from 3' to 4' at 16:13. Extra volume required for duplicate sample.
	5	3	2" SS	1.8	3 5	Orange-brown to gray-brown fine SAND, trace silt (moist)	
	6				7 6		Environmental soil sample LB-6-196 collected from 5.5' to 6' at 16:15.
	7	4	2" SS	1.4	4 5	Orange-brown to gray-brown fine SAND, trace silt (wet)	
	8				4 7	Black SILT, trace fine sand (wet)	Environmental soil sample LB-6-197 collected from 7.5' to 8' at 16:20.
	9	5	2" SS	1.6	7 8	Black fine SAND, some silt (wet)	
	10				15 17		Environmental soil sample LB-6-198 collected from 9.5' to 10' at 16:22.
	11					BOTTOM OF BORING @ 10'	STOP: 16:20 Notes: 1. Duplicate sample DUP-18-226 collected at sample location LB-6-195.
	12						

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

ORIGINAL

LOG OF BORING NO: LB-7

Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~11 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
							START: 12:25
	1	1	3" SS	1.3	13	Gray-brown to orange-brown SILT, some clay, trace fine sand (moist)	PID=0 ppm for entire boring.
					6		
	2				5		Environmental soil sample LB-7-199 collected from 1' to 2' at 12:43. Extra volume required for MS/MSD sample.
					7		
	3	2	2" SS	1.7	4	Orange-brown SILT, some fine sand, trace clay (moist)	
					4		
	4				4	Orange-brown fine SAND, trace to some silt (moist)	Environmental soil sample LB-7-201 collected from 3.5' to 4' at 12:45.
					4		
	5	3	2" SS	1.3	6	Orange-brown fine SAND, trace silt (moist)	
					5		
	6				9		Environmental soil sample LB-7-202 collected from 5.5' to 6' at 12:49.
					9		
	7	4	2" SS	1.6	9	Orange-brown fine SAND, trace silt (moist)	
					10		
	8				9	Black fine SAND, trace silt (moist)	Environmental soil sample LB-7-203 collected from 7.5' to 8' at 12:52.
					9		
	9	5	2" SS	1.6	4	Black fine SAND, trace silt (moist)	Color changes occur at 7.6' and at 8.8'.
					4	Orange-brown fine SAND, trace silt (moist)	
	10				8		Environmental soil sample LB-7-204 collected from 9' to 10' at 12:55. Extra volume required for duplicate sample.
					9		
						BOTTOM OF BORING @ 10'	STOP: 12:50
	11						Notes:
							1. Duplicate sample DUP-15-223 collected from sample location LB-7-204.
	12						2. MS/MSD sample LB-7-200 collected from sample location LB-7-199.
							3. Boring was relocated about 20' north of proposed location.

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River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-8

Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~11 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
	1	1	3" SS	1.4	10 10	Gray-brown coarse to fine SAND, some silt, trace medium to fine gravel (moist)	START: 14:10 PID=0 ppm.
	2				8 6		Environmental soil sample LB-8-205 collected from 1.5' to 2' at 14:25.
	3	2	2" SS	1.6	3 3	Orange-brown fine SAND, some silt (moist)	PID=0 ppm.
	4				3 2		Environmental soil sample LB-8-206 collected from 3.5' to 4' at 14:30.
	5	3	2" SS	1.9	4 3	Orange-brown fine SAND, some silt (moist)	PID=0 ppm.
	6				3 3	Light gray SILT, some fine sand, trace clay (moist)	Environmental soil sample LB-8-207 collected from 5.5' to 6' at 14:33.
	7	4	2" SS	1.9	3 3	Light gray SILT, some fine sand, trace clay (moist)	PID=0 ppm. Slight odor noted.
	8				4 6	Black silty fine SAND (moist to wet)	Environmental soil sample LB-8-208 collected from 7.5' to 8' at 14:36.
	9	5	2" SS	1.5	4 4	Medium gray fine SAND, trace to some silt (wet)	PID=17 ppm from 8' to 10' Moderate to strong odor noted.
	10				6 10		Environmental soil sample LB-8-209 collected from 9.5' to 10' at 14:40.
	11					BOTTOM OF BORING @ 10'	STOP: 14:56 Notes: 1. Duplicate sample DUP-16-224 collected at sample location LB-8-205.
	12						

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-9

Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~11 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
							START: 13:38
	1	1	3" SS	1.3	21	Brown medium to fine SAND, some silt (dry)	PID=1 to 2 ppm. Slight odor noted.
					16		
	2				18		Environmental soil sample LB-9-210 collected from 1' to 2' at 13:55. Extra volume required for MS/MSD sample.
					14		
	3	2	2" SS	1.7	4	Brown to gray-brown medium to fine SAND, trace to some silt (moist)	PID=0 ppm. Slight odor noted.
					5		
	4				5		Environmental soil sample LB-9-212 collected from 3.5' to 4' at 13:58.
					5		
	5	3	2" SS	1.7	5	Gray-brown medium to fine SAND, trace to some silt (moist)*	PID=0 ppm. Slight odor noted.
					4		
	6				5	Black SILT, trace to some fine sand (moist)	Environmental soil sample LB-9-213 collected from 5.5' to 6' at 14:02.
					3		
	7	4	2" SS	1.5	4	Black SILT, trace to some fine sand (moist)	PID=0 ppm. Slight odor noted.
					4		
	8				5		Environmental soil sample LB-9-214 collected from 7.5' to 8' at 14:05.
					7		
	9	5	2" SS	2.0	4	Black SILT (moist to wet)	PID=0 ppm. Slight odor noted.
					9		
	10				13		Environmental soil sample LB-9-215 collected from 9.5' to 10' at 14:07.
					11	Black silty coarse to fine SAND (moist)	
	11					BOTTOM OF BORING @ 10'	STOP: 14:00
	12						Notes: 1. MS/MSD sample LB-9-211 collected from sample location LB-9-210.

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River Drive Center 1, Elmwood Park, NJ 07407

LOG OF BORING NO: LB-10 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	~11 feet MSL, Topo Map,1983
Drilling Agency :	Advanced Drilling, Inc.	Date :	31 January 1996
Drilling Equipment :	Strata Star 15	Completion Depth :	10 feet
Size and Type of Bit :	8 Inch Diameter Auger	Water Level :	~3 feet
Sampler :	2 Inch or 3 Inch Diameter Steel Split Spoon	Foreman :	Scott Alberalla
Sampler Hammer	Drop : 30 Inches / Weight : 140 Pounds	Inspector :	Paul McAndrew

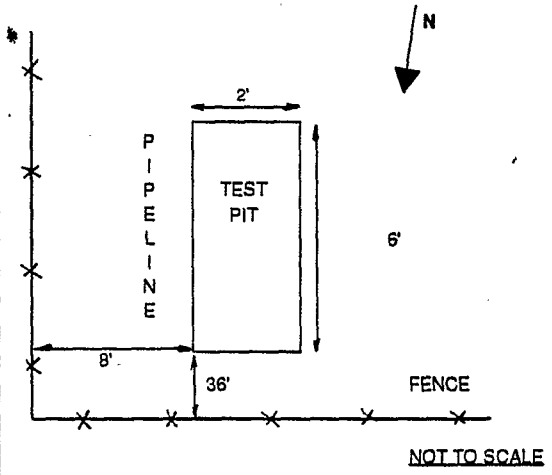
Strata	Depth (feet)	SAMPLES Number	Type	Recovery (ft)	Blow Counts (blows/6 in)	DESCRIPTION	REMARKS
							START: 13:05
	1	1	3" SS	1.5	22 15	Gray-brown to orange-brown SILT, some clay, trace fine sand (moist)	PID=0 ppm for entire boring.
	2				12 8		Environmental soil sample LB-10-216 collected from 1.5' to 2' at 13:15.
	3	2	2" SS	1.3	4 3	Gray-brown to orange-brown SILT, some clay, trace fine sand (moist)	
	4				3 3		Environmental soil sample LB-10-217 collected from 3.5' to 4' at 13:20.
	5	3	2" SS	1.3	8 5	Orange-brown fine SAND, trace to some silt (moist to wet)	
	6				5 4		Environmental soil sample LB-10-218 collected from 5.5' to 6' at 13:22.
	7	4	2" SS	1.3	4 4	Orange-brown fine SAND, some silt (moist to wet)	
	8				6 8		Environmental soil sample LB-10-219 collected from 7.5' to 8' at 13:25.
	9	5	2" SS	2.0	6 5	Orange-brown fine SAND, some silt (moist to wet)	
	10				6 6	Mottled orange-brown and light gray SILT, some fine sand, trace clay (moist)	Environmental soil sample LB-10-220 collected from 9.5' to 10' at 13:29.
	11					BOTTOM OF BORING @ 10'	STOP: 13:30
	12						

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-1

Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	6 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Republic Environmental Systems	Date : 8/29/95	Completion Depth : 6.0 feet
Excavation Equipment :	CAT 416EH Backhoe		Water Level : 4.8 feet

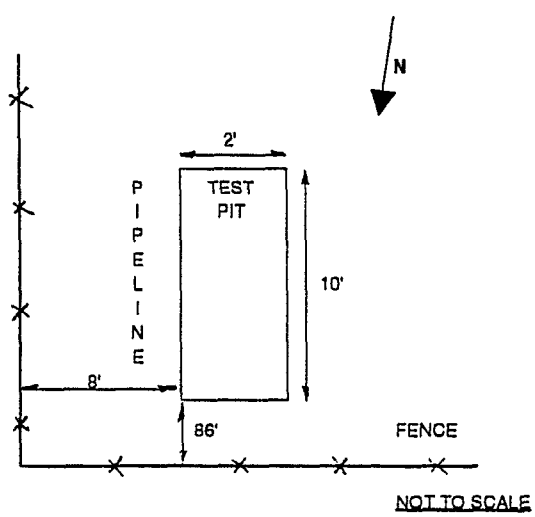
Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
				Brown medium to fine SAND, trace silt (moist)	START: 10:30
	1	048	GRAB	Gray medium to fine SAND, some silt (moist to wet)	Level D PPE Treated wood pieces/timbers present Water in pit is black, possibly from organics.
	2				Strong odor, water entering the pit. Pit walls caving at 3.3 ft., water entering pit at 2ft.
	3				Environmental soil sample TP-1-048 collected from 0.75' to 1.25' at 10:50.
	4				Wood plank encountered on East side of pit.
				Gray coarse GRAVEL and medium to fine SAND seam (wet)	
	5			Gray CLAY and SILT, stiff (wet)	
	6	049	GRAB		Environmental soil sample TP-1-049 collected from 5.5' to 6.0' at 10:45.
				BOTTOM OF TEST PIT @ 6.0 FEET	STOP: 11:15
	7			 NOT TO SCALE	AIR MONITORING RESULTS Breathing zone during excavation: PID=0 to1 ppm Hnu readings were zero until water was encountered. CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-2 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	6 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Republic Environmental Systems	Date :	Completion Depth : 6.0 feet
Excavation Equipment :	CAT 416EH Backhoe	8/29/95	Water Level : 3.7 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown medium to fine SAND, trace silt (moist)	START: 11:25 Water in pit is black, odor was noted.
	2	050	GRAB		Environmental soil sample TP-2-050 was collected from 1.5' to 2' at 11:35.
	3			Gray SILT, some medium to fine sand (wet)	
	4				
	5				
	6	051	GRAB	Brown CLAY and SILT, stiff (wet)	Environmental soil sample TP-2-051 was collected from 5' to 5.5' at 11:30.
	7			BOTTOM OF TEST PIT @ 6.0 FEET	
	8				STOP: 11:50
	9				
	10				AIR MONITORING RESULTS Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm Over Excavation: PID=7ppm CS2 Draeger tube = 8ppm
	11				
	12				
	13				
	14				
	15				



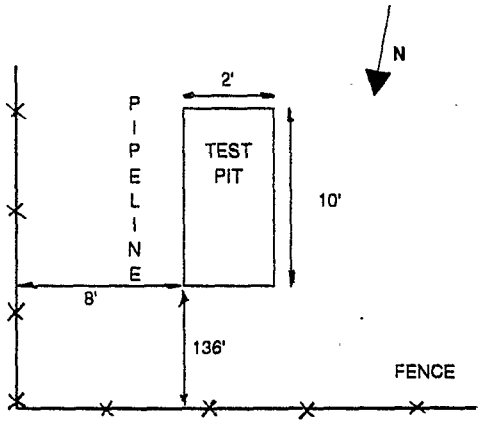
NOT TO SCALE

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-3 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	6 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Republic Environmental Systems	Date :	Completion Depth : 6.5 feet
Excavation Equipment :	CAT 416EH Backhoe	8/29/95	Water Level : 4.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown medium to fine SAND, trace silt (moist)	START: 12:30
	2	052 062	GRAB DUP1		Environmental soil sample TP-3-052 collected from 1.5' to 2' at 12:45.
	3				Strong odor at 3ft.
	4			Brown fine SAND, some silt (wet)	
	5				
	6	053	GRAB		Environmental soil sample TP-3-053 collected from 5.5' to 6' at 12:50.
				Gray CLAY and SILT, stiff (wet)	
	7			BOTTOM OF TEST PIT @ 6.5 FEET	STOP: 13:00
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				



AIR MONITORING RESULTS

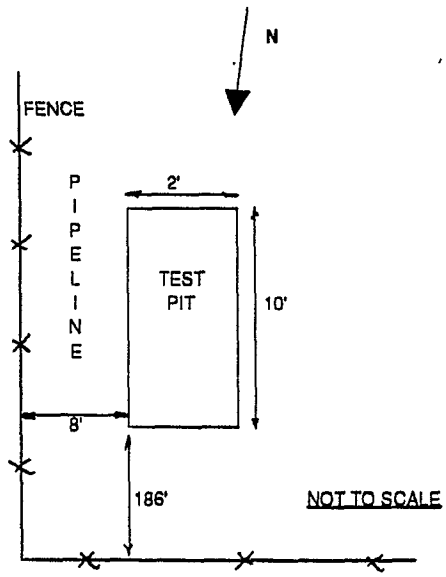
Breathing zone during excavation:
- PID=1 to 2 ppm
- CS2 Draeger tubes < 0.1 ppm
- H2S Draeger tubes < 0.5 ppm
- NH4 Draeger tubes < 5.0 ppm

In test pit after excavation:
- PID=20 ppm
- CS2 Draeger tubes = 5 ppm

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-4 Sheet 1 of 1

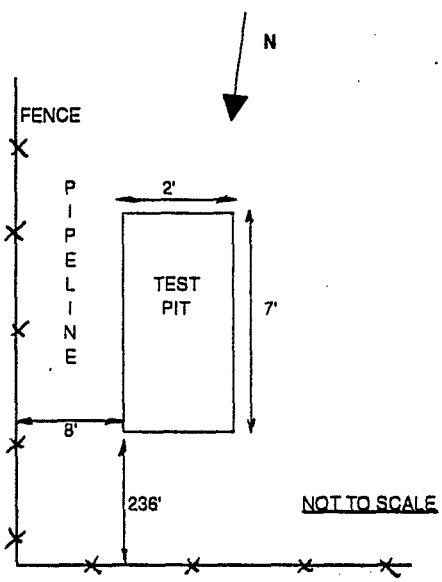
Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	6 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Republic Environmental Systems	Date :	Completion Depth : 7.0 feet
Excavation Equipment :	CAT 416EH Backhoe	8/29/95	Water level : 4.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown medium to fine SAND, trace silt (moist)	START: 14:00
	2	054	GRAB		Environmental soil sample TP-4-054 collected from 1.5' to 2.0' at 14:10.
	3			Black fine SAND, some silt (moist)	
	4				
	5				
	6	055	GRAB		Environmental soil sample TP-4-055 collected from 5.5' to 6.0' at 14:05.
	7			Gray CLAY and SILT, stiff (wet)	
	8			BOTTOM OF TEST PIT @ 7.0 FEET	STOP: 14:15
	9				AIR MONITORING RESULTS
	10				Breathing zone during excavation:
	11				PID=0 ppm
	12				CS2 Draeger tubes < 0.1 ppm
	13				H2S Draeger tubes < 0.5 ppm
	14				NH4 Draeger tubes < 5 ppm
	15				In test pit after excavation:
					PID=20 ppm
					CS2 Draeger tubes = 3 ppm

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-5 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	6 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Republic Environmental Systems	Date :	Completion Depth : 7.0 feet
Excavation Equipment :	CAT 416EH Backhoe	8/29/95	Water Level : 4.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown medium to fine SAND, trace silt	START: 14:20 Ditch is dry.
	2	056	GRAB MS/ MSD		Environmental soil sample TP-5-056 collected from 1.5' to 2.0' at 14:30.
	3			Black fine SAND, some silt, little medium to fine gravel	
	4			Black 0.5 to 0.75-inch GRAVEL	Possible fill from water line.
	5			Black fine SAND, some silt	
	6	057 063	GRAB DUP2	Gray CLAY and SILT, stiff	Environmental soil sample TP-5-057 collected from 5.5' to 6.0' at 14:25.
	7				
	8			BOTTOM OF TEST PIT @ 7 FEET	STOP: 14:45
	9				AIR MONITORING RESULTS Breathing zone during excavation: CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm PID = 0 to 20 ppm In test pit after excavation: CS2 Draeger tubes = 5.0 ppm
	10				
	11				
	12				
	13				
	14				
	15				

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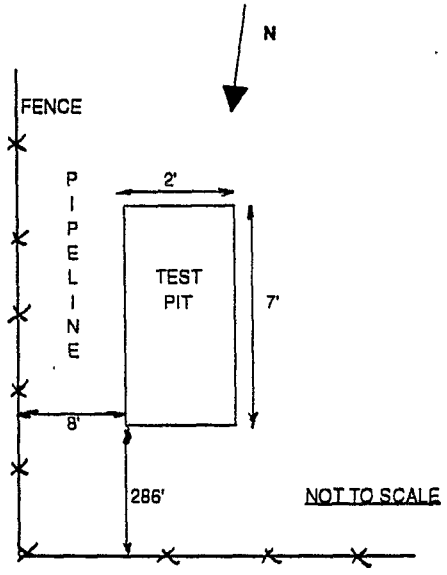
LOG OF TEST PIT NO: TP-6 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	6 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Republic Environmental Systems	Date : 8/29/95	Completion Depth : 7.0 feet
Excavation Equipment :	CAT 416EH Backhoe		Water Level : 5.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–3	058	GRAB	Brown medium to fine SAND, little medium to fine gravel, trace silt, wood pieces; looks like 4-inch pile, lots of wood	START: 14:55 Environmental soil sample TP-6-058 collected from 2.5' to 3.0' at 15:20.
	4–6	059	GRAB	Black medium to fine SAND, some silt (wet)	Environmental soil sample TP-6-059 collected from 5.5' to 6.0' at 15:15.
	6–7			Gray CLAY and SILT, stiff (wet)	
	7			BOTTOM OF TEST PIT @ 7.0 FEET	STOP: 15:30



AIR MONITORING RESULTS

Breathing zone during excavation:
CS2 Draeger tubes = 3.0 ppm
H2S Draeger tubes < 0.5 ppm
NH4 Draeger tubes < 5ppm
PID = 0ppm

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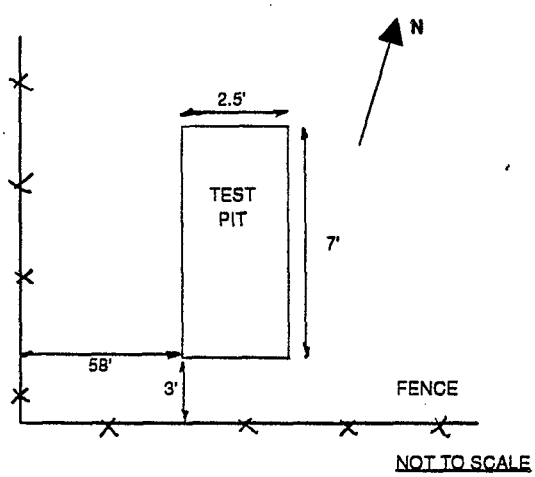
2061601\TPDITCH1.XLS

LOG OF TEST PIT NO: TP-7 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/14/95	Completion Depth : 6.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 3.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–6	112	GRAB	Dark brown medium to fine SAND, some silt, trace to some coarse sand, trace cobbles, trace coarse to fine gravel (moist)	START: 9:15 Concrete, wood, plastic and other debris noted. 10" thick concrete slab encountered at 3' depth in south end of pit. Environmental soil sample TP-7-112 collected from 2.5' to 3.0' at 10:05. Sample collected from black stained soil. Slow groundwater seepage at 3' depth. Water exhibits a slight sheen.
	4–5	111	GRAB	Black fine sandy SILT, some clay (moist) Medium gray CLAY, some medium to fine sand (moist)	Black staining and strong organic odor noted in silt. Environmental soil sample TP-7-111 collected from 4.5' to 5.0' at 9:35. Strong odor noted in clay.
	7–15			BOTTOM OF TEST PIT @ 6.0 FEET	STOP: 10:15



AIR MONITORING RESULTS

Breathing zone during excavation:
PID=0 ppm
CS2 Draeger tubes < 0.1 ppm
H2S Draeger tubes < 0.5 ppm
NH4 Draeger tubes < 5.0 ppm

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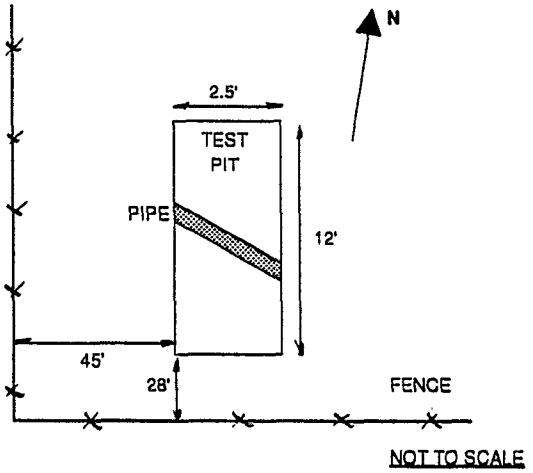
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-8 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 7.5 feet
Excavation Equipment :	John Deere 310 D Backhoe	12/14/95	Water Level : 3.5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Gray-brown coarse to fine SAND, trace to some coarse to fine gravel, trace to some silt (dry)	START: 10:25 Occasional reeds, wood and bricks observed. Very strong odor noted.
	2			Black medium to fine SAND, some silt, trace coarse sand (moist)	Soil is stained black. Concrete slab encountered at 2' depth in south end of pit.
	3	113	GRAB		Environmental soil sample TP-8-113 collected from 3.0' to 3.5' at 11:15. Soil exhibits a strong odor.
	4			Black clayey SILT, some coarse to fine sand, trace fine gravel, trace organic debris (moist to wet)	Slow groundwater seepage at 3.5' depth. Apparently perched water.
	5			Light gray to yellow-brown CLAY, some silt, trace medium to fine sand (moist to wet)	
	6				6" diameter steel pipe aligned northwest/ southeast uncovered at 6' depth. Excavation terminated at 7.5' due to presence of pipe.
	7	114	GRAB		Environmental soil sample TP-8-114 collected from 7.0' to 7.5' at 11:35. Sample collected from unstained soil.
	8			BOTTOM OF TEST PIT @ 7.5 FEET	STOP: 11:05
	9				AIR MONITORING RESULTS
	10				Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	11				
	12				Note: MS/MSD sample TP-8-115 collected sample location TP-8-114.
	13				
	14				
	15				



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River Drive Center 1, Elmwood Park, NJ 07407

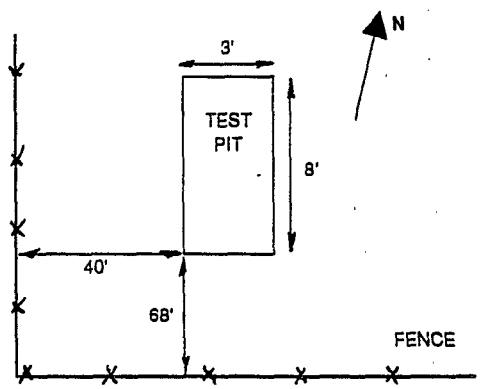
2061601\TP-DITCH.XLS

AR306113

LOG OF TEST PIT NO: TP-11 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/14/95	Completion Depth : 10.5 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 7.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–10				START: 12:10
				Yellow-brown coarse to fine SAND, some silt (dry to moist)	Concrete, brick and wood debris encountered.
					Black staining starts at 3.4' depth.
	4	116	GRAB	Black fine sandy SILT, trace to some clay (moist)	Environmental soil sample TP-11-116 collected from 3.5' to 4.0' at 12:50.
	5–6				Occasional thin sand layers exhibiting red-brown, purple and yellow-green staining observed. Sample TP-11-116 collected from stained area.
				Gray-brown CLAY, some silt, trace fine sand (moist)	
	7–9			Mottled gray and yellow-brown SILT, trace to some fine sand, trace medium to fine gravel, trace clay (moist to wet)	Groundwater rapidly enters excavation at 10.5' depth and rises to 7.0' depth.
	10	117	GRAB		Environmental soil sample TP-11-117 collected from 9.5' to 10.0' at 13:35.
					Groundwater rapidly enters at 10.5' depth.
	11–15			BOTTOM OF TEST PIT @ 10.5 FEET	STOP: 13:20



AIR MONITORING RESULTS

Breathing zone during excavation:
PID=0 ppm
CS2 Draeger tubes < 0.1 ppm
H2S Draeger tubes < 0.5 ppm
NH4 Draeger tubes < 5.0 ppm

In test pit after excavation:
PID=0 ppm
CS2 Draeger tubes < 0.1 ppm

Note:
Dupilcate sample DUP-5-121 and USEPA split sample collected at sample location TP-11-116.

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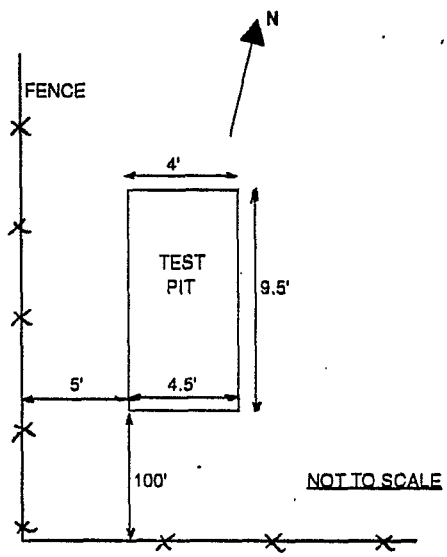
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-12 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8.75 ft. MSL(est.). Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/12/95	Completion Depth : 7.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water level : 7.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			FILL: dry to moist Dark yellow-brown medium to fine SAND, trace to some silt, trace medium to fine gravel, trace coarse sand (moist)	START: 10:20 Top 3" of soil is frozen. Occasional pieces of wood and piping observed.
	2			Medium gray organic fine sandy SILT, trace coarse to medium sand (moist)	Strong organic odor. Occasional plant stems, stalks and roots observed. Rubber hose and timber pieces excavated.
	3			becoming Mottled dark gray to brown CLAY and SILT, trace fine sand (moist to wet)	PID=25 ppm at 3', falling quickly to 0 ppm.
	4	088	GRAB		Environmental soil sample TP-12-088 collected from 3.5' to 4.0' at 11:17. Sample collected from stained soil.
	5			Yellow-brown to gray CLAY and SILT, trace to some fine sand (moist to wet)	Frequent reed stalks and roots excavated. Strong odor noted.
	6	089	GRAB		Environmental soil sample TP-12-089 collected from 5.5' to 6.0' at 11:20.
	7				Slow groundwater seepage at 7' depth.
	8			BOTTOM OF TEST PIT @ 7.0 FEET	STOP: 11:05
	9				AIR MONITORING RESULTS Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm In test pit after excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm
	10				
	11				
	12				
	13				
	14				
	15				

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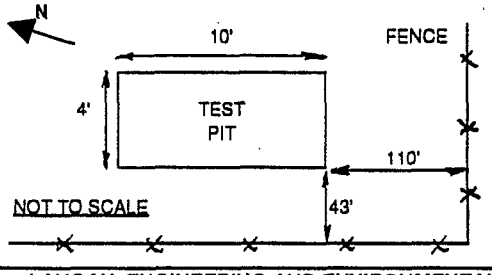
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-13 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 12.0 feet
Excavation Equipment :	John Deere 310 D Backhoe	12/14/95	Water Level : 12.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–6			Medium brown coarse to fine SAND, some silt, trace cobbles, trace coarse to fine gravel (moist)	START: 14:20 Occasional concrete, brick and wood debris encountered, Plywood, fiberglass and sheet plastic debris encountered.
	4–6			Black medium to fine sandy SILT (moist)	Silt contains occasional thin layers of sand exhibiting dark red-brown staining.
	6	118	GRAB		Environmental soil sample TP-13-118 collected from 5.5' to 6.0' at 14:45. Sample collected from stained soil.
	7–9			Gray-brown organic CLAY, trace to some silt, trace fine sand (moist) becoming Gray silty CLAY, trace fine sand (moist)	Frequent reeds and roots observed. Occasional thin peat layers from 7.0' to 7.5' depth.
	10–11			Mottled gray and yellow-brown clayey SILT, some fine sand, trace organic debris (moist)	Groundwater rapidly enters excavation at 12.0' depth. Frequent small globules of black liquid observed, possible free product.
	12	119	GRAB	Gray-brown coarse to fine SAND, trace fine gravel, trace silt (moist to wet)	Environmental soil sample TP-13-119 collected from 11.5' to 12.0' at 15:15.
	13–15			BOTTOM OF TEST PIT @ 12 FEET	STOP: 15:00



AIR MONITORING RESULTS

Breathing zone during excavation:
CS2 Draeger tubes < 3.0 ppm
H2S Draeger tubes < 0.5 ppm
NH4 Draeger tubes < 5.0 ppm

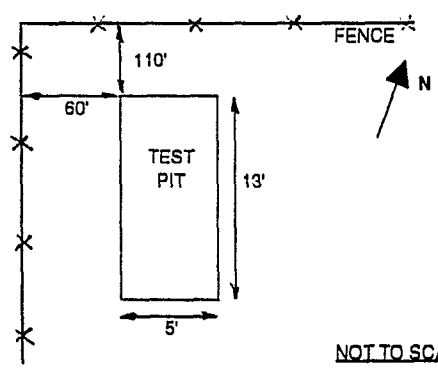
In test pit after excavation:
CS2 Draeger tubes < 3.0 ppm

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-18 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 10.3 feet
Excavation Equipment :	John Deere 310 D Backhoe	12/14 to 12/15/95	Water Level : 2.5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–15			Medium brown coarse to fine SAND, some silt, trace to some coarse to fine gravel, trace cobbles (moist)	START: 15:45 Brick, wood, plastic and conrete debris encountered.
					Groundwater fills excavation to 2.5' depth. Water is black and exhibits an oily sheen.
				Wooden DEBRIS	Debris includes planks, railroad ties and plastic tubing. Debris is stained black.
				becoming	
				Wooden DEBRIS mixed with black silty fine SAND, trace to some clay (wet)	
	6	120	GRAB		Environmental soil sample TP-18-120 collected from 5.5' to 6.0' at 16:20 on 12/14.
				Gray-brown organic silty CLAY, trace fine sand (wet)	Cease excavation on 12/14 at 6' depth at 16:30. Resume on 12/15 at 9:02.
				Mottled gray and brown SILT, some clay, trace fine sand (wet)	PID = 3 to 10 ppm, with peaks of 40 ppm.
				becoming	
				Mottled gray and yellow-brown clayey SILT, some fine sand (wet)	Frequent thin layers of sand noted. At sample TP-18-125 location, PID=40 ppm.
	10	125	GRAB		Environmental soil sample TP-18-125 collected from 9.7' to 10.2' at 9:45 on 12/15.
				BOTTOM OF BORING @ 10.3 FEET	STOP: 9:30



AIR MONITORING RESULTS

Breathing zone during excavation:
CS2 Draeger tubes < 3.0 ppm
H2S Draeger tubes < 0.5 ppm

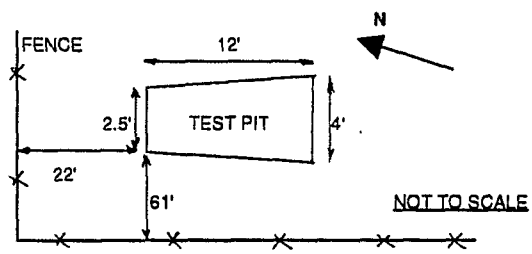
In test pit after excavation:
CS2 Draeger tubes = 6.5 ppm at 10.2' depth.

Note:
Dupilcate sample DUP-6-128 collected at sample location TP-18-125.

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-21 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/15/95	Completion Depth : 12.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 3.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
					START: 10:10
	1			Yellow-brown silty coarse to fine SAND, trace coarse to fine gravel (moist)	Wood, brick, concrete, piping and plastic debris noted.
	2				
	3				Groundwater fills excavation to 3.0' depth. Water is black and exhibits slight sheen.
	4			Mottled dark to light gray to yellow brown silty coarse to fine SAND, trace to some coarse to fine gravel, trace clay (moist)	Soil is stained gray to black starting at 3' depth.
	5				
	6				Occasional layers of crushed cinder fill observed. PID=9 ppm at 5' depth.
	7				
	8			Dark gray-brown organic clayey SILT, trace fine gravel to fine sand (wet)	
		126	GRAB		Environmental soil sample TP-21-126 collected from 8.0' to 8.5' at 11:20.
	9			Dark brown PEAT (moist to wet)	PID=800 to 1,000 ppm in silt and peat. Occasional 1/16" yellow-green crystals observed in the silt.
	10			Gray-brown CLAY, some fine sand, trace silt, trace organic debris (wet)	PID=10 to 40 ppm immediately above the excavated soil pile. PID=0 ppm at 10' from pile.
	11				Purple-brown staining observed in sand. PID=900 ppm.
	12	127	GRAB	Gray-brown to light gray fine SAND, some silt, with layers of light gray clay (wet)	Environmental soil sample TP-21-127 collected from 11.5' to 12.0' at 11:35.
				BOTTOM OF TEST PIT @ 12 FEET	STOP: 11:30
	13				AIR MONITORING RESULTS
	14				Breathing zone during excavation: PID=5 to 60 ppm CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	15				Note: Backhoe operator reported soil flashing during backfilling of excavation.

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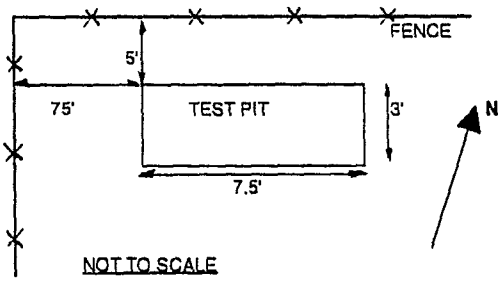
LOG OF TEST PIT NO: TP-23 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/18/95	Completion Depth : 8.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : Not Encountered

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
					START: 9:30
	1			Yellow-brown to brown silty coarse to fine SAND, some coarse to fine gravel (wet)	Steel cables, pipes, concrete and wood debris noted
	2				
	3			Dark gray-brown silty coarse to fine SAND, some coarse to fine gravel (moist)	Brick and concrete debris encountered.
	4				
	5			Gray-brown to black clayey SILT, trace fine gravel to fine sand (moist to wet)	
	6			Dark brown PEAT, some fine sand, trace to some silt (moist to wet)	PID=300 to 400 ppm at 6.0' depth.
	7			Gray-brown to black CLAY, trace to some silt, trace fine sand (moist to wet)	PID=500 ppm at 8.0' depth.
	8	132	GRAB		Environmental soil sample TP-23-132 collected from 7.5' to 8' at 14:55.
				BOTTOM OF BORING @ 8.0 FEET	STOP: 11:00
	9				AIR MONITORING RESULTS Breathing zone during excavation: PID=5 to 8 ppm
	10				
	11				Note: Excavation activities terminated after explosions were observed in test pit and over excavated soil pile. Smaller secondary explosions and smoking occurred in excavated soil pile for up to 1.5 hours.
	12				
	13				
	14				
	15				

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River Drive Center 1, Elmwood Park, NJ 07407

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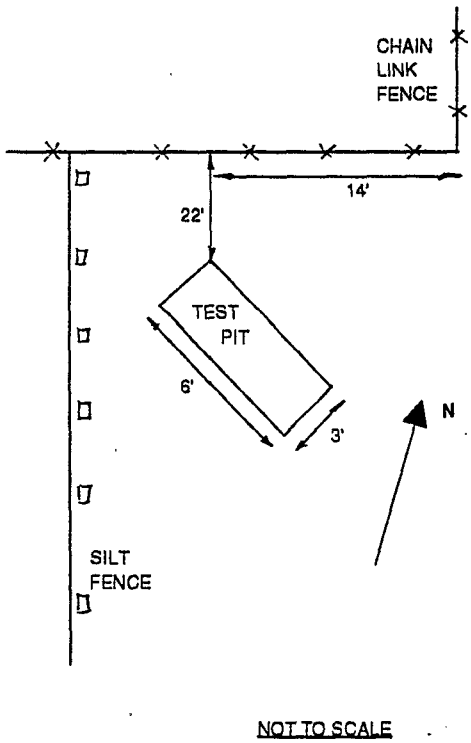
LOG OF TEST PIT NO: TP-24 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 5.5 feet
Excavation Equipment :	John Deere 310 D Backhoe	12/11/95	Water Level : ~3.5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–5			FILL: dry to moist Brown to yellow-brown medium to fine SAND, trace to some silt, trace coarse to fine gravel, trace clay	Start : 14:40 Occasional thin laminations of fine sand and light gray silt/clayey silt observed. PID=0 ppm in sand.
	3	072	GRAB	SOIL and CINDER FILL: moist to wet Black coarse to fine SAND, trace to some silt, trace coarse to fine gravel	Environmental soil sample TP-24-072 collected from 2.6' to 3.1' at 14:40. PID=0 ppm in fill. Broken glass, timber and moderate organic odor observed. Soil stains gloves and sampling equipment black.
	5	073	GRAB	Medium gray CLAY, trace to some silt, trace medium to fine sand (moist to wet)	Slow groundwater seep across top of clay Environmental soil sample TP-24-073 collected from 4.3' to 4.8' at 14:55.
	6–15			END OF EXCAVATION @ 5.5 FEET	STOP: 14:55



NOT TO SCALE

AIR MONITORING RESULTS:

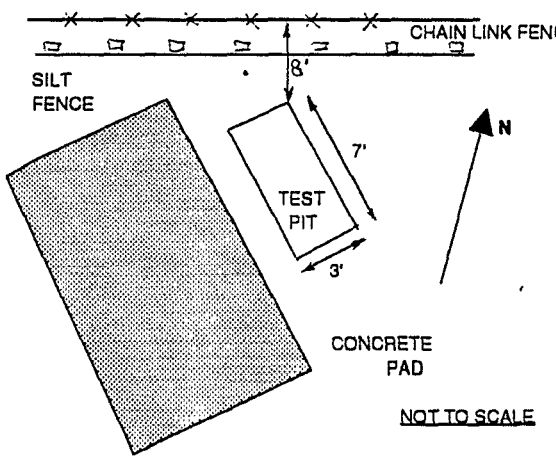
Breathing zone during excavation:
PID = 0 ppm
CS2 Draeger tubes < 3 ppm
H2S Draeger tubes < 0.5 ppm

In test pit after excavation:
PID = 0 ppm
CS2 Draeger tubes < 3 ppm

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-25 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/12/95	Completion Depth : 5.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : ~3.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			FILL: moist Yellow-brown silty fine SAND, some coarse to fine gravel, trace coarse to medium sand	START: 13:00 USEPA identifies the yellow-brown sand as fill emplaced following USEPA's removal action of spring/summer 1995.
	2			Black SILT, some clay, trace to some coarse to fine gravel, trace coarse to fine sand (moist)	Strong organic odor in the silt. Groundwater seep at 2.4'. Sheen on water.
	3	091	GRAB	becoming	Environmental soil sample TP-25-091 collected from 2.5' to 3.0' at 13:45. Large quantity of broken glass in silt.
	4				
	5	090	GRAB	Medium gray SILT, trace to some fine sand, trace to some clay, frequent reeds and organic debris (moist to wet)	Environmental soil sample TP-25-090 collected from 4.0' to 4.5' at 13:30. Frequent black stained sand layers.
	6			BOTTOM OF TEST PIT @ 5.0 FEET	STOP: 14:00
	7				Note: USEPA split sample collected at TP-25-091 location.
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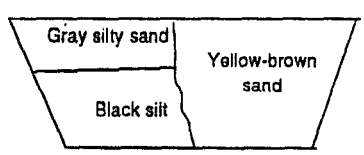
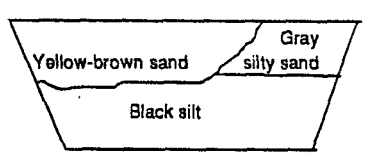
	12				
	13				
	14				
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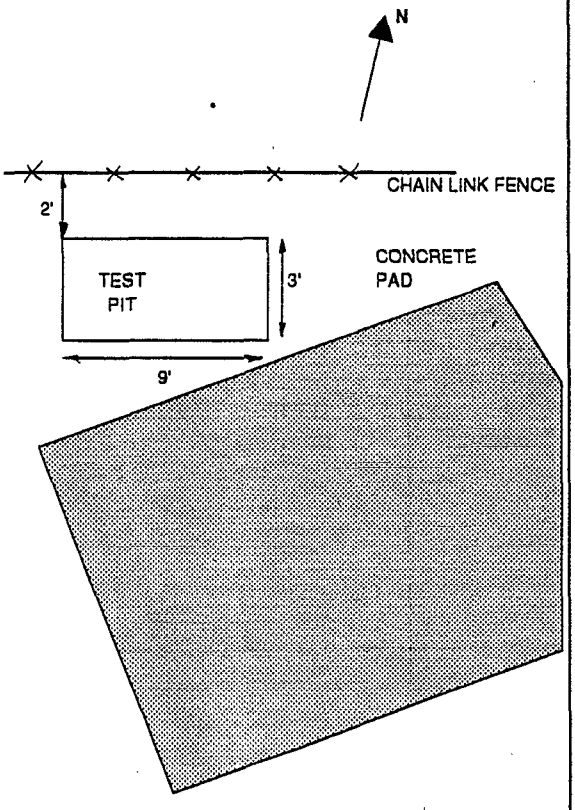
LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

2061601TP-SUMP.XLS

AR306121

LOG OF TEST PIT NO: TP-26 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/14/95	Completion Depth : 4.4 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : ~3.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Gray-brown silty medium to fine SAND, trace cobbles, trace coarse to fine gravel (dry)	START: 8:15 Wood and metal debris noted.
	2	110	GRAB		Environmental soil sample TP-26-110 collected from 1.7' to 2.2' at 8:40.
	3			Dark gray to black fine SAND, some silt (dry to moist)	Bottles, brick, wire, rubber and wood debris. Moderate odor noted.
	4	109	GRAB	Medium gray silty CLAY, trace to some fine sand, occasional plant roots and organic debris (moist)	Environmental soil sample TP-26-109 collected from 3.9' to 4.4' at 8:35.
	5			BOTTOM OF TEST PIT @ 4.4 FEET	STOP: 8:45
	6				AIR MONITORING RESULTS: Breathing zone during excavation: PID = 0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm In test pit after excavation: PID = 0 ppm CS2 Draeger tubes < 0.1 ppm
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LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-27 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/12/95	Completion Depth : 6.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : ~3.5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1				START: 14:40
	2			Dark gray to black medium GRAVEL and coarse to fine SAND (dry)	
	3			Dark gray to black SILT, trace to some medium to fine sand, trace clay, frequent plant roots (moist)	Brick and wood debris encountered.
	4	092	GRAB	becoming	Environmental soil sample TP-27-092 collected from 3.0' to 3.5' at 15:25.
	5	094	GRAB	Dark gray clayey SILT, trace to some fine sand, occasional plant debris (moist)	Strong organic odor noted.
	6			becoming	Environmental soil sample TP-27-094 collected from 4.5' to 5.0' at 15:35.
	7			Dark gray fine sandy SILT, trace to some clay (moist)	Strong organic odor noted.
	8			BOTTOM OF TEST PIT @ 6.0 FEET	STOP: 16:00
	9				Note: MS/MSD samples collected at TP-27-092 and TP-27-094 sample locations.
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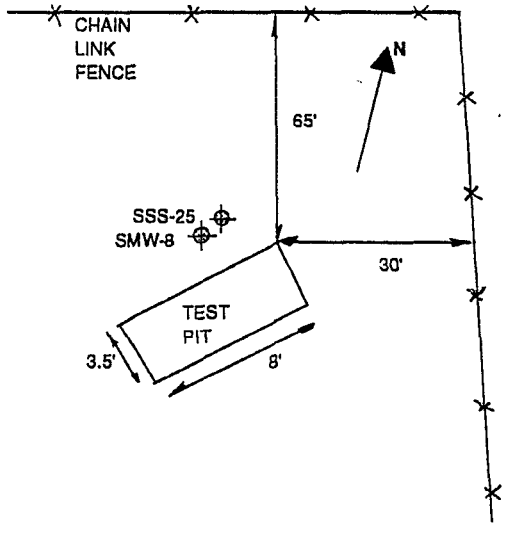

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

2061601\TP-SUMP.XLS

LOG OF TEST PIT NO: TP-28 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	7.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/11/95	Completion Depth : 7.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 2.2 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			FILL: dry to moist Tan gray to brown medium to fine SAND, some silt, trace medium to fine gravel with occasional lenses/pockets of silty clay	START: 9:40 Exposed ground surface frozen to six inch inch depth. Surficial coarse gravel from adjacent railroad track bed.
	2	067	GRAB		Environmental soil sample TP-28-067 collected from 1.7' to 2.2' at 10:10.
	3				Water enters excavation rapidly after excavating cinder fill at 3' depth.
	4			CINDER and ASH FILL: wet Dark gray to black coarse to fine SAND, some coarse to fine gravel, trace to some silt	Fill consists of gravel to sand-sized slag, cinders, coal and slate/shale fragments.
	5				
	6	069	GRAB		Environmental soil sample TP-28-069 collected from 5' to 5.5' at 10:50.
	7	068	GRAB	Medium gray CLAY, trace to some silt, trace fine sand with occasional plant roots and organic debris	Environmental soil sample TP-28-068 collected from 6.5' to 7' at 10:40.
	8			BOTTOM OF EXCAVATION @ 7.0 FEET	STOP: 10:00
	9				AIR MONITORING RESULTS
	10				Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 3 ppm H2S Draeger tubes < 0.5 ppm
	11				In test pit after excavation: PID=0 ppm CS2 Draeger tubes < 3 ppm H2S Draeger tubes < 0.5 ppm
	12				Note: CONRAIL representative present during test pit excavation.
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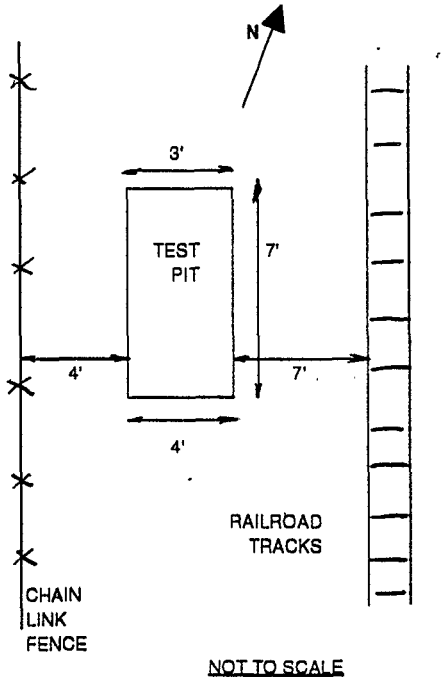

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-29 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	7.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/11/95	Completion Depth : 5.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 3.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			FILL: dry to moist Brown to yellow-bown coarse to fine SAND, some silt, trace coarse to fine gravel, occasional thin layers of light gray clayey silt	START: 11:25 Ground surface frozen to 5 inch depth. Frequent plant roots. Water rapidly enters excavation after cinder fill is excavated. Slight sheen on water surface.
	2				
	3			CINDER and ASH FILL: wet Dark gray to black coarse to fine SAND, some coarse to fine gravel, trace to some silt	Fill consists of cinder, slag, coal and shale.
		070	GRAB		Environmental soil sample TP-29-070 collected from 3' to 3.5' at 11:50.
	4	071	GRAB	Yellow-gray SILT, some medium to fine sand, trace clay (moist)	Environmental soil sample TP-29-071 collected from 3.5' to 4' at 12:05. Ocasional to frequent plant roots. Slight organic odor.
	5			Medium gray CLAY, some fine sand and silt (wet)	Thin layers/lenses of fine sand observed.
				BOTTOM OF TEST PIT @ 5 FEET	STOP: 11:55
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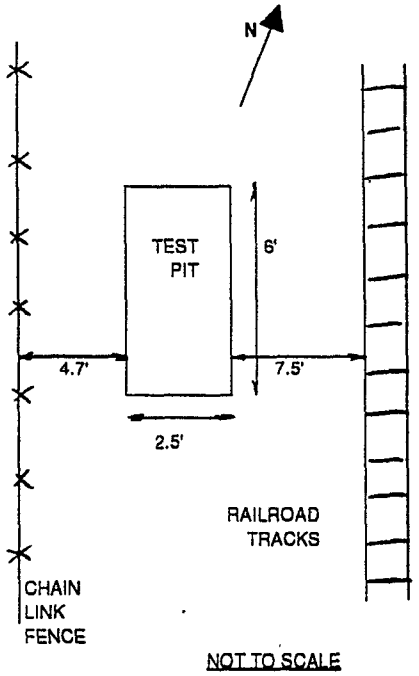

NOT TO SCALE

AIR MONITORING RESULTS

Breathing zone during excavation:
PID=0 ppm
CS2 Draeger tubes < 3 ppm
H2S Draeger tubes < 0.5 ppm

In test pit after excavation:
PID=0 ppm
CS2 Draeger tubes < 3 ppm

Note:
CONRAIL representative present during test pit excavation.

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-30 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	7.25 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/13/95	Completion Depth : 6.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 2.6 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Yellow-brown coarse to fine SAND, trace fine gravel, with occasional lenses of silty clay (moist to wet)	START: 8:20
		104	GRAB	becoming	Environmental soil sample TP-30-104 collected from 1.1' to 1.6' at 12:05.
	2			Gray-brown silty medium to fine SAND (moist)	PID=0 ppm at 2' depth.
					Slight to moderate organic odor at 2.5'.
	3			CINDER and SOIL FILL: wet	Wood plank noted along west wall of test pit at 2.5' to 3' depth.
				Dark-gray to black SAND and CINDERS, trace to some slag, trace cobbles, trace coarse gravel	PID=0 ppm at 3' depth.
	4	099	GRAB		Environmental soil sample TP-30-099 collected from 3.5' to 4.0' at 8:45.
				becoming	
	5			Dark gray to black medium to fine SAND, trace to some silt (wet)	PID=0 ppm at 5' depth.
				Dark brown PEAT, trace to some medium to fine sand (moist)	Occasional reeds noted.
	6			Medium gray CLAY, trace to some silt (moist)	
				BOTTOM OF EXCAVATION @ 6.0 FEET	STOP: 9:15
	7				
	8				AIR MONITORING RESULTS
	9				Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm
	10				In test pit after excavation: PID=0 ppm CS2 Draeger tubes < 3 ppm
	11				Note: 1. EPA split sample collected at sample location TP-30-099. 2. Sample TP-30-104 collected immediately above the water main. 3. Duplicate sample DUP-4-105 collected at environmental sample TP-30-099 location.
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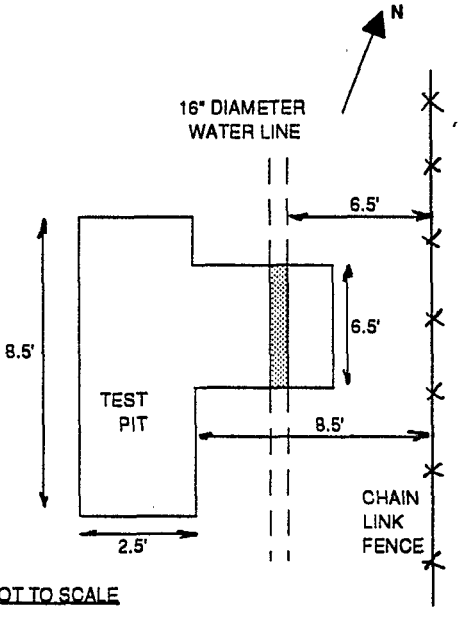
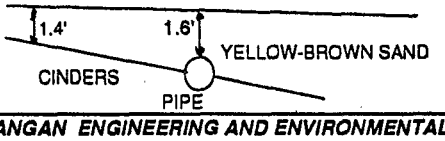


NOT TO SCALE

SOUTH SIDEWALL OF WATER LINE EXCAVATION



LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-31 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	7.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/13/95	Completion Depth : 6.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 3.6 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1				START: 9:53
		100	GRAB	Yellow-brown medium to fine SAND, trace medium to fine gravel, trace silt, occasional roots (wet)	PID=0 ppm at 1' depth.
	2			becoming	Environmental soil sample TP-31-100 collected from 0.8' to 1.3' at 10:00.
	3			Dark gray to black coarse to fine SAND, some silt, trace to some clay, trace fine gravel (wet)	PID=0 ppm at 2' depth. Moderate to strong odors noted.
		101	GRAB		Environmental soil sample TP-31-101 collected from 3.0' to 3.5' at 10:15.
	4				Environmental groundwater sample TP-31-102 collected at 10:40.
	5			Dark brown PEAT	Thin dark gray to black sandy layers and strong organic odor noted in clay.
		103	GRAB	Dark gray CLAY, some silt, trace medium to fine sand (moist)	Environmental soil sample TP-31-103 collected from 5.5' to 6.0' at 11.05.
	6			BOTTOM OF TEST PIT @ 6.0 FEET	STOP: 11:00
	7				
	8				AIR MONITORING RESULTS
	9				Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm
	10				In test pit after excavation: PID=0 ppm CS2 Draeger tubes = 1 ppm
	11				
	12				Note: 1. EPA split sample collected at sample location TP-31-101. 2. Groundwater sample TP-31-102 contained possible free product. Small globules of black liquid noted.
	13				
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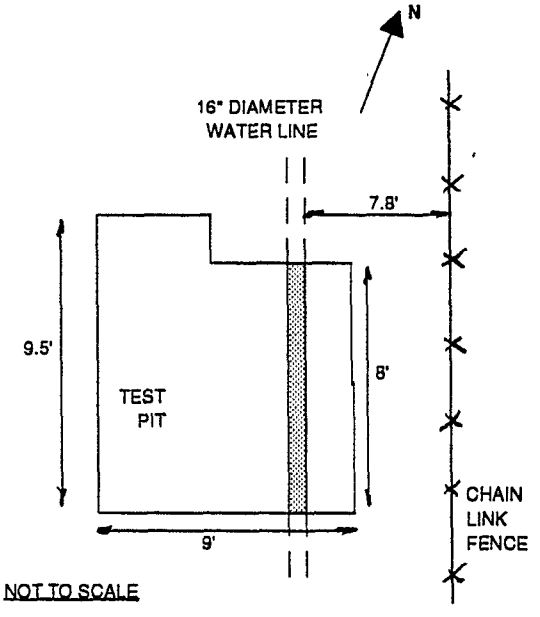

NOT TO SCALE

SOUTH SIDEWALL OF WATER LINE EXCAVATION

0'
1.3' Yellow-brown sand
1.8' Black cinders/slag
5.0' Yellow-gray sand
Black sand

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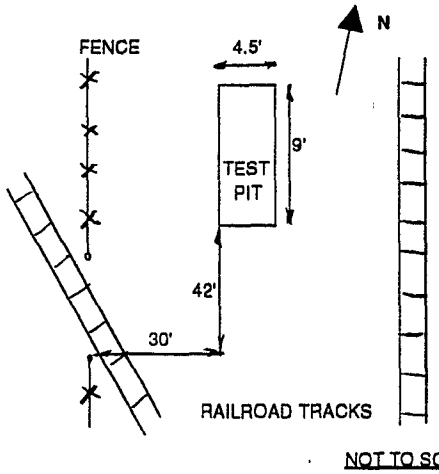
River Drive Center 1, Elmwood Park, NJ 07407

2061601\TP-MAIN.XLS

AR306127

LOG OF TEST PIT NO: TP-32 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 8.5 feet
Excavation Equipment :	John Deere 310 D Backhoe	12/11/95	Water Level : 8.5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown to yellow-brown medium to fine SAND, trace to some silt, trace fine gravel, frequent thin layers/lenses of gray clayey silt (dry to moist)	START: 15:15 Occasional cobbles, moderate odor.
	2			becoming	Silt content appears to decrease with depth.
	3				
	4	075	GRAB	Yellow-brown medium to fine SAND, trace silt (moist)	Environmental soil sample TP-32-075 collected from 3.0' to 3.5' at 16:00.
	5				
	6				
	7			Light gray SILT, trace to some fine sand, trace to some clay (moist) Light gray fine sand, some silt (moist) Light gray SILT, trace to some fine sand, trace to some clay (moist)	
	8			Light to dark gray medium to fine SAND, trace silt (moist to wet)	Environmental soil sample TP-32-074 collected from 8.0' to 8.5' at 15:30. Groundwater seepage noted at 8.5'.
		074	GRAB		
	9			BOTTOM OF TEST PIT @ 8.5 FEET	STOP: 15:35
	10			 NOT TO SCALE	AIR MONITORING RESULTS Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 3 ppm H2S Draeger tubes < 0.5 ppm In test pit after excavation: PID=0 ppm CS2 Draeger tubes < 3 ppm Note: Attempts to excavate below 8.5 foot depth unsuccessful due to unstable nature of excavation sidewalls.
	11				
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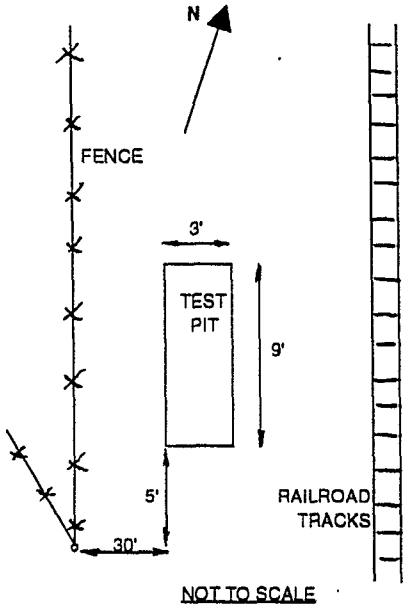
LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-33 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/11/95	Completion Depth : 6.5 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 5.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1–4	076	GRAB	Yellow-brown medium to fine SAND, trace to some silt, trace medium to fine gravel, trace coarse sand (dry to moist)	START: 15:40 Environmental soil sample TP-33-076 collected from 3.0' to 3.5' at 16:15.
	5			Light gray clayey fine SAND, some silt (moist)	Clayey fine sand layer is approximately 1' thick. Groundwater seepage noted at 5' depth.
	6	077	GRAB	Dark gray CLAY, trace to some medium to fine sand, trace to some silt (moist to wet)	Clay contains thin layers of yellow-brown fine sand. Dark gray color change at 6'. Environmental soil sample TP-33-077 collected from 6.0' to 6.5' at 16:37.
	7			BOTTOM OF TEST PIT @ 6.5 FEET	STOP: 16:05



NOT TO SCALE

AIR MONITORING RESULTS

Breathing zone during excavation:
PID=0 ppm
CS2 Draeger tubes < 3 ppm
H2S Draeger tubes < 0.5 ppm

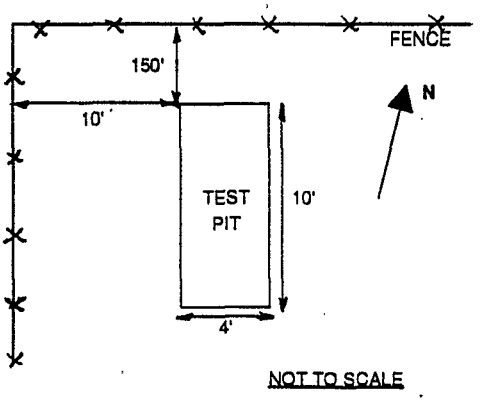
In test pit after excavation:
PID=0 ppm
CS2 Draeger tubes < 3 ppm

Notes:
1. Unidentified obstruction encountered in south end of test pit at 6' depth.
2. Slight to moderate organic odor beginning at 4' depth.
3. Duplicate sample DUP-3 collected at environmental sample TP-33-077 location.

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-34 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/28/95	Completion Depth : 10.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 10.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
					START: 10:30
	1			FILL: dry to moist Yellow-brown coarse to fine SAND, some coarse to fine gravel, trace to some silt, trace cobbles	Soil is frozen to 1' depth. Asphalt, brick, plastic and wood debris observed. PID=0 ppm.
	2				
	3				Large pieces of asphalt at 3' depth. Soil is micaceous.
	4			FILL: moist Yellow-brown to gray silty medium to fine SAND, trace to some coarse to fine gravel, trace clay	Occasional black stained soil layers at 4'. PID=1 ppm.
		136	GRAB		Environmental soil sample TP-34-136 collected from 4.0' to 4.5' at 11:35.
	5			Gray-brown to dark gray silty CLAY, trace fine sand, frequent plant roots (moist to wet)	
	6				Dark gray/black/purple-red staining in sandy zone at 6' depth.
				becoming	
	7				
	8			Mottled light gray to yellow-brown CLAY, trace to some silt, trace fine sand (moist to wet)	
	9				Slow groundwater seepage at 10' depth. PID=15 ppm at 10' depth.
	10	137	GRAB	Mottled yellow-brown to light gray silty fine SAND, some clay, occasional plant roots (moist to wet)	Environmental soil sample TP-34-137 collected from 9.5' to 10.0' at 11:45.
				BOTTOM OF TEST PIT @ 10.0 FEET	STOP: 11:50
	11			 NOT TO SCALE	AIR MONITORING RESULTS Breathing zone during excavation: PID = 0 ppm CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm Note: 1. Duplicate sample DUP-7-142 collected at sample location TP-34-136. 2. MS/MSD sample TP-34-138 collected at sample location TP-34-137.
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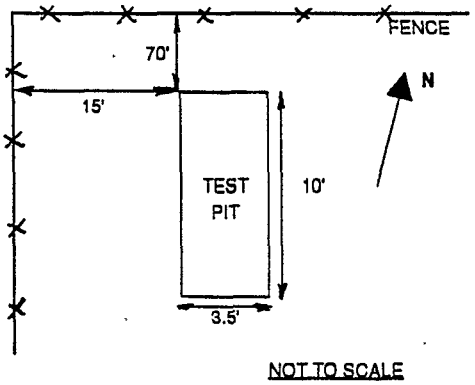
LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-35 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/28/95	Completion Depth : 10.0 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 10.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
					START: 12:30
	1			Brown coarse to fine SAND, trace to some coarse to fine gravel, trace to some silt (dry)	Soil is frozen to 1' depth. Frequent brick and concrete fragments.
	2			DEBRIS mixed with gray to black coarse to fine SAND, some coarse to fine gravel, trace cobbles, trace silt (dry)	Debris is stained black and consists of wood, brick, glass, metal and concrete.
	3				Frequent crushed concrete debris.
	4			Dark gray to black coarse to fine GRAVEL, some cobbles (dry)	
	5			Black fine sandy SILT, trace to some clay, trace plant debris (moist)	PID=1 ppm in peat layer.
		139	GRAB	Dark gray-brown to black PEAT, some medium to fine sand, trace to some silt (moist)	Environmental soil sample TP-35-139 collected from 5.0' to 5.5' at 13:40.
	6			Medium gray SILT, some clay, trace fine sand, trace plant debris (moist)	
	7			becoming	
	8			Yellow-brown to light gray clayey SILT, trace to some fine sand (moist to wet)	Occasional thin layers of black staining. Occasional plant roots.
	9				
	10	140	GRAB	Yellow-brown fine SAND, some silt, occasional pockets of light gray clay (moist to wet)	Water rapidly enters excavation at 10' depth. Occasional plant roots at 10' depth. Environmental soil sample TP-35-140 collected from 9.5' to 10.0' at 13:45.
				BOTTOM OF TEST PIT @ 10.0 FEET	STOP: 13:50
	11				AIR MONITORING RESULTS
	12				Breathing zone during excavation: PID = 0 ppm CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	13				
	14				Note: 1. Duplicate sample DUP-8-143 collected at sample location TP-35-139. 2. Duplicate sample DUP-9-144 collected at sample location TP-35-140.
	15			NOT TO SCALE	

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

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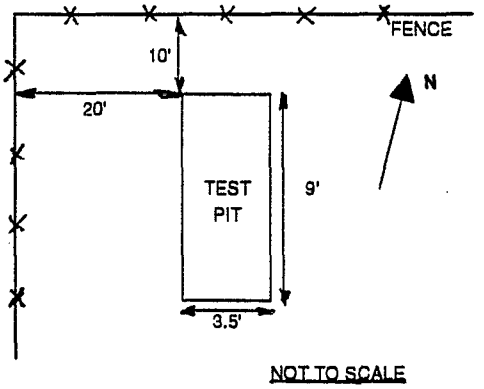
AR306131

LOG OF TEST PIT NO: TP-36 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061601
Location :	Wilmington, Delaware	Elev. and Datum :	8.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date : 12/28/95	Completion Depth : 10.5 feet
Excavation Equipment :	John Deere 310 D Backhoe		Water Level : 2.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Yellow-brown coarse to fine SAND, some silt, trace coarse to fine gravel (dry to moist)	START: 14:20
	2			Dark gray to brown coarse to fine SAND, trace to some coarse to fine gravel, trace to some silt, trace cobbles (moist)	Water fills excavation to 2' depth. Water is black and exhibits an oily sheen.
	3			DEBRIS FILL	Debris consists primarily of wood with cinder block, concrete, brick and metal.
	4				PID=0 ppm at 2' depth.
	5				Amount of wooden debris increases with depth.
	6				
	7				PID=10 ppm immediately above excavated debris pile.
	8			Mottled medium gray to yellow-brown clayey SILT, trace to some fine sand (moist)	PID=50 ppm in soil excavated at 8' depth.
	9				Occasional black staining and fine plant roots.
	10	141	GRAB		Environmental soil sample TP-36-141 collected from 9.5' to 10.0' at 15:25. PID=100 to 170 ppm in soil excavated at 10' depth.
	11			BOTTOM OF TEST PIT @ 10.5 FEET	STOP: 13:30
	12			 NOT TO SCALE	AIR MONITORING RESULTS Breathing zone during excavation: CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	13				Note: 1. Duplicate sample DUP-10-145 collected at sample location TP-36-141.
	14				
	15				

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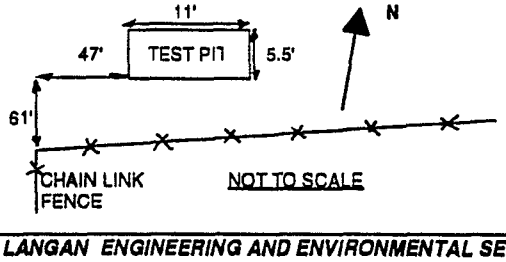
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-37 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	9.5 ft. MSL(est.), Topo Map.1983
Excavation Contractor :	Code Environmental Svcs.	Date : 1/30/96	Completion Depth : 14.0 feet
Excavation Equipment :	John Deere 690 ELC Trackhoe		Water Level : Seep at 5.5 feet

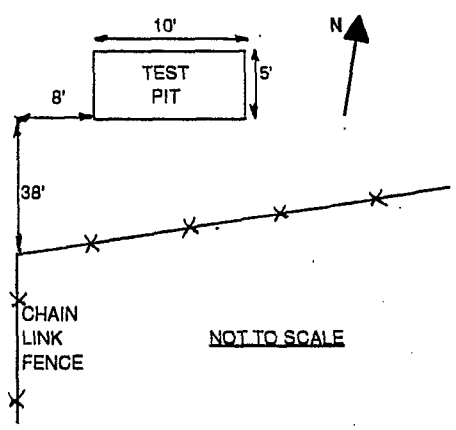
Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown silty medium to fine SAND, trace coarse sand to fine gravel (moist)	START: 11:25 Occasional bricks, timbers, concrete fragments and plant roots observed.
	2				
	3			Medium to dark gray silty coarse to fine SAND and SILT, trace to some coarse to fine gravel (moist)	
	4				
	5				PID=5 to10 ppm at 5.5'.
	6			FILL: moist to wet Gray coarse to fine SAND, some silt, trace cobbles, with frequent bricks, wood, concrete and metal debris	Strong odor at 5'. Frequent groundwater seeps at 5.5'.
	7				
	8			Dark to medium gray CLAY, trace fine sand, trace silt (moist)	PID=100 to 120ppm near 8', with peaks of up to 500 ppm.
	9	163	GRAB	Brown organic peaty SILT, trace fine sand (moist to wet)	Environmental soil sample TP-37-163 collected from 8' to 8.5' at 12:10. EPA split sample. Peaty layer is 6" thick. Strong odor noted.
	10			Light to medium gray SILT, trace fine sand, trace clay, trace fine plant roots (moist)	
	11			becoming	
	12				
	13			Medium gray clayey SILT, trace to some fine sand, trace fine gravel (moist to wet)	Rootlets at 13'.
	14	164	GRAB	Orange brown to gray coarse to fine SAND, some silt, trace to some fine gravel (moist to wet)	Environmental soil sample TP-37-164 collected from 13' to 13.5' at 12:30.
	15			BOTTOM OF TEST PIT @ 14.0'	
	16				AIR MONITORING RESULTS Breathing zone during excavation: CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	17				

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-38 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	9 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 10.0 feet
Excavation Equipment :	John Deere 690 ELC Trackhoe	1/30/96	Water level : Seep at 5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
					START: 09:20
	1			FILL: moist Medium brown coarse to fine SAND, trace to some silt, trace coarse to fine gravel, trace cobbles, occasional plant roots	Bricks, concrete, asphalt pavement fragments and wood encountered.
	2				Gray staining starts at 2'.
	3			FILL: dry to moist Mottled gray to brown coarse to fine SAND, trace to some coarse to fine gravel, trace to some silt, trace cobbles	PID=10 ppm at 3'.
	4				
	5			FILL: moist Medium gray coarse to fine SAND, some silt, trace to some coarse to fine gravel	Strong odor at 5'.
	6				
	7			Gray CLAY, trace to some fine sand, trace silt (moist)	Dark red staining observed in sand layers at 7'. PID=5 ppm.
		160	GRAB	Matted plant debris with layers of fine sand (moist)	Environmental soil sample TP-38-160 collected from 7' to 7.5' at 10:10. MS/MSD and EPA split sample collected at same location.
	8				
	9			Gray CLAY, trace fine sand, trace silt, occasional plant roots	Frequent plant roots at 10'. PID=0 ppm at 10'.
	10	162	GRAB	Mottled brown to gray CLAY, some silt, trace to some fine sand (wet)	Environmental soil sample TP-38-162 collected from 9.5' to 10' at 10:30. EPA VO split and duplicate sample DUP-12-165 at same location.
				BOTTOM OF TEST PIT @ 10.0'	STOP: 10:50
	11				
	12				AIR MONITORING RESULTS Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm
	13				In test pit after excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm
	14				
	15				



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River Drive Center 1, Elmwood Park, NJ 07407

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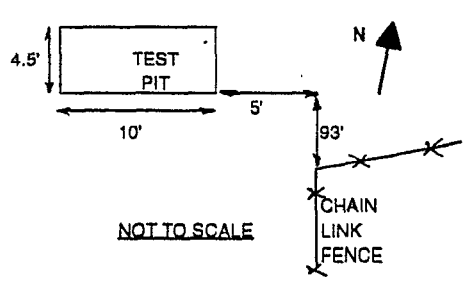
LOG OF TEST PIT NO: TP-39 Sheet 1 of 1

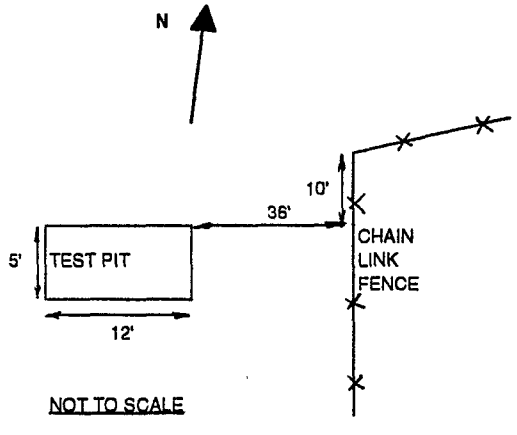
Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	9.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 12.0 feet
Excavation Equipment :	John Deere 690 ELC Trackhoe	1/29/96	Water Level : 3.0 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
					START: 15:45
	1			Medium brown medium to fine SAND, some silt, trace coarse sand to fine gravel (moist)	Bricks, concrete and wood encountered.
	2			becoming	
	3			Mottled brown to gray coarse to fine SAND, trace to some medium to fine gravel, trace to some silt (moist)	Moderate to strong odor at 2'.
	4				Dark gray staining observed starting at 3.5'.
					PID=10 ppm at 4'.
		153	GRAB		Environmental soil sample TP-39-153 collected from 4' to 4.5' at 16:40.
	5				PID=5 to 7 ppm at 5'.
	6			AUTOMOBILE TIRES	1.5 inch diameter pipe at 5' removed.
					Water rapidly enters excavation through tire fill and rises to 3'.
	7			Medium gray CLAY, trace fine sand, trace silt (moist to wet)	Strong odor at 7'.
					Trace plant roots at 7'.
	8				Slight yellow/red staining at 8'.
				Dark gray to black clayey SILT, trace fine sand, with matted plant debris (moist to wet).	EPA collects VO sample from 8' to 8.5'.
	9			Medium gray clayey SILT, trace medium to fine sand (moist to wet)	Strong odor at 9'.
	10				
	11			Mottled light gray and yellow brown silty fine SAND, trace to some clay (moist to wet)	
		154	GRAB		Environmental soil sample TP-39-154 collected from 11.5' to 12' at 16:50.
	12				
				BOTTOM OF TEST PIT @ 12.5'	STOP: 16:40
	13				AIR MONITORING RESULTS
	14				Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 0.1 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	15				

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-40 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	8.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 9.5 feet
Excavation Equipment :	John Deere 690 ELC Trackhoe	1/29/96	Water Level : Seep at 5 feet

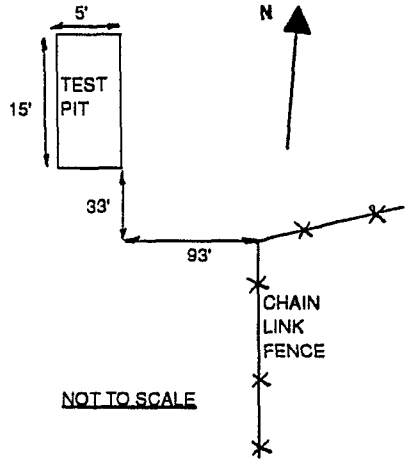
Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Brown to yellow brown coarse to fine SAND, trace to some coarse to fine gravel, trace to some silt (moist)	START: 14:00 Concrete, brick, wood, plastic, asphalt, metal and rubber encountered.
	2				Stained soil at 1.5' to 2.5'.
	3			FILL: moist Gray-brown coarse to fine SAND, some silt, trace boulders and cobbles, with concrete, bricks, metal, plastic, tires, wood and plant debris	
	4				
	5				Strong odor at 4.5'. Trace plant roots at 5.5'.
	6	151	GRAB		Environmental soil sample TP-40-151 collected from 5.5' to 6' at 14:45. EPA VO split location.
	7			Black to dark gray SILT, some clay, trace fine sand (moist)	
	8			Mottled brown and gray fine SAND and SILT, trace to some clay (moist)	Trace plant debris at 7'.
	9				
		152	GRAB	Mottled yellow brown to gray silty fine SAND, trace clay (moist to wet)	Environmental soil sample TP-40-152 collected from 9' to 9.5' at 14:55. EPA VO split and duplicate sample DUP-11-156 at same location.
	10			BOTTOM OF TEST PIT @ 9.5'	STOP: 14:40
	11			 NOT TO SCALE	AIR MONITORING RESULTS Breathing zone during excavation: PID=0 ppm CS2 Draeger tubes < 3.0 ppm H2S Draeger tubes < 0.5 ppm NH4 Draeger tubes < 5.0 ppm
	12				
	13				
	14				
	15				

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

LOG OF TEST PIT NO: TP-41 Sheet 1 of 1

Project Name :	Halby Chemical	Project Number :	2061604
Location :	Wilmington, Delaware	Elev. and Datum :	9.5 ft. MSL(est.), Topo Map,1983
Excavation Contractor :	Code Environmental Svcs.	Date :	Completion Depth : 9.0 feet
Excavation Equipment :	John Deere 690 ELC Trackhoe	1/29/96	Water Level : Seep at 5 feet

Strata	Depth (ft)	No.	Type	DESCRIPTION	REMARKS
	1			Yellow brown coarse to fine SAND, some coarse to fine gravel, trace to some clay, trace cobbles (wet)	START: 11:50 Wood, steel, brick and concrete debris encountered.
	2				
	3			Dark gray coarse to fine SAND, trace to some fine gravel, trace to some silt, large amount of construction debris (wet)	Large amount of debris from 2' to 6' including wood, plastic, bricks, concrete, asphalt shingles and solidified liquid asphalt.
	4			becoming	PID=1.5 to 3 ppm at 4'. Slight organic odor.
	5	149	GRAB	Medium gray silty fine SAND and construction debris (moist to wet)	Environmental soil sample TP-41-149 collected from 4' to 4.5' at 13:05. MS/MSD and EPA split sample at same location. Groundwater seep at 5'.
	6				Large boulders, tree limbs and tree trunks at 5'.
	7			Medium to dark gray SILT, some fine sand (moist to wet)	
	8			Mottled brown to gray CLAY, trace to some silt, trace fine sand (moist to wet)	
	9			becoming	PID=0 ppm at 9'. Trace plant roots at 9'.
		150	GRAB	Yellow brown silty CLAY, trace fine sand (moist to wet)	Environmental soil sample TP-41-150 collected from 8.5' to 9' at 13:15. EPA split sample.
				BOTTOM OF TEST PIT @ 9.0'	STOP: 12:55



AIR MONITORING RESULTS

Breathing zone during excavation:
- PID=0 ppm
- CS2 Draeger tubes < 3.0 ppm
- H2S Draeger tubes < 0.5 ppm
- NH4 Draeger tubes < 5.0 ppm

LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
River Drive Center 1, Elmwood Park, NJ 07407

APPENDIX C

RAM SERVICES WATER MAIN INVESTIGATION REPORT

RAM SERVICES
P.O. BOX 38
BELLVALE, NEW YORK 10912
(914) 986-5822
FAX (914) 986-5828

January 2, 1996

Site Corrosion Survey/Investigation of the 16 Inch Diameter Water Main at the HALBY Chemical Site Wilmington, New Castle County, Delaware

Prepared For

Langan
Engineering & Environmental Services, Inc.
River Drive Center 1
Elmwood Park, NJ 07407

Verbal order for Service
RAM SERVICES Job No. 0482-S

RAM SERVICES
P.O. BOX 38
BELLVALE, NEW YORK 10912
(914) 986-5822
FAX (914) 986-5828

Table of Contents

Appendix

RAM SERVICES
P.O. BOX 38
BELLVALE, NEW YORK 10912
(914) 986-5822
FAX (914) 986-5828

I. Introduction

On December 13, 1995, RAM SERVICES personnel conducted a Site Corrosion Survey/Investigation, on that portion of the 16 inch diameter Water Main, that passes through the HALBY Chemical Site, in Wilmington, Delaware. The purpose of this survey was to obtain sufficient field data to effectively evaluate the present condition of the subject water line relative to corrosion damage and remaining serviceable life.

Prior to the start of any work at this location, a short informal meeting was conducted to review the site conditions and health & safety precautions specific to this site.

Survey/Investigative work conducted at that time was limited in area to that section of underground Water Main piping within the boundaries of the enclosed fence area, as shown on Langan Engineering drawing, Job No. 2061601, dwg. No.3. A modified and marked-up copy of, part of, this drawing is attached to and made part of this report.

The following report presents our Site Description, Summary of Results & Recommendations, Test Procedures, Corrosion Control - Overview, Discussion of Results and Recommendations. The appendix of this report includes a typed copy of our field obtained data, site drawing, Electrochemistry of Corrosion and General Cast Iron Pipe Information.

II. Site Description

The HALBY Chemical Site, is located on Terminal Avenue approximately one quarter mile East of Route 9, in Wilmington, New Castle County, Delaware. The specific work area at this site is within the fence enclosed area at the rear and along the Railroad tracks on the North side of this facility, (see attached dwg.).

Within this area and beyond, basically North & South, the subject 16 inch Water Main runs parallel & adjacent to the Railroad tracks. For the purpose of this Survey/ Investigation, testing was only conducted within the limits of the fenced-in area.

III. Summary of Results and Recommendations

From the results of our testing, a moderate to progressively less corrosive soil environment was found along the pipeline route, at the HALBY Chemical Site. Potential measurements, indicating the degree of corrosion activity indicate a "normally corroding, buried steel structure" potential range and no evidence of stray D.C. current was detected during this survey/investigation.

As part of this survey/investigation, two excavations were made to expose the buried pipeline. At both locations the buried piping was found wrapped in a "Plastic" wrap. This wrap at both locations, was observed to tightly encase the pipeline but was not bonded to it and found in excellent condition within the limits of the excavation. At the Northern most excavation, a ring of "plastic" wrap, approximately 6 inches wide was removed from the pipeline for a close visual examination and ultra sonic thickness testing. At the Southern most excavation, only a window was cut through the "plastic" at the top, 12-0-clock, position for visual examination. Piping at both locations was observed to be in excellent condition.

Although field testing and observations made at this site indicate only a moderately corrosive environment and the piping appeared to be in excellent condition, we would be remiss, from a Corrosion Control/Cathodic Protection standpoint not to suggest your consideration of installing sacrificial anodes to control corrosion and further prolong the useful life of this pipeline.

IV. **Test Procedures**

Using a high input impedance digital voltmeter in conjunction with a M.C.M. Copper/Copper Sulfate Reference Electrode, structure-to-soil potentials were measured and recorded at both pipeline excavations.

Using a Fluke multimeter, continuity of the pipeline was measured between the two excavations.

Using a NDT model 701 ultra sonic thickness measuring instrument with transducer, pipeline thickness measurements were taken at the 12 clock positions around the pipe at both excavations.

Soil resistivity measurements were obtained both with the soil box method, from soil obtained adjacent to the pipeline during excavation and by using the Weiner 4-pin method from a grade setup, measuring down to pipe depth (approximately 18").

The presence or absence of D.C. stray current was determined by structure-to-electrode potential fluctuation. If stray current was indicated by this test method, it was confirmed by a strip chart record or data logging of potentials over a minimum of four (4) hours.

VI. **Corrosion Control Overview**

1. Corrosion of Buried and Submerged Structures

Corrosion is an electrochemical process by which steel and other metals attempt to return to their natural ore condition. In this process the metal is corroded by discharges of electrical metallic ions to earth.

There are many different causes of corrosion, among which the most common are:

A) Dissimilar metals that are electrically tied together
B) Dissimilar soils
C) Differential aeration
D) Anaerobic bacteria
E) Outside sources of D.C. current

In order to determine the degree of possible corrosion, the resistivity of the soil and/or water in which the structure is buried and/or submerged is measured. The ground soil/water resistivity classification (used in this report) relating the possible degree of corrosivity to its resistivity are as follows:

A) 0 to 1,000 ohm-cm - Extremely Corrosive
B) 1,000 to 2,000 ohm-cm - Very Corrosive
C) 2,000 to 10,000 ohm-cm - Moderately Corrosive
D) 10,000 and over - Progressively less corrosive

These classifications are general. Under certain conditions, severe corrosion can occur in the higher resistivity soils/water.

2. Bare Versus Coated Underground/Submerged Structures

Contrary to the belief of many people unfamiliar with the process of corrosion, a coated structure not protected with cathodic protection could develop failures in a corrosive environment a lot sooner than a bare structure.

The reason for this is that on a bare structure corrosion tends to spread itself uniformly over the area of the structure, therefore, delaying the complete penetration

of the structure. On the other hand, on a coated structure corrosion concentrates at small areas (that is, at faults in the coating), thus accelerating the possibility of total penetration of the structure.

3. Cathodic Protection

In order to stop corrosion, the flow of current to earth/water from the metallic structure has to be stopped. This can be accomplished easily by the use of sacrificial anodes which supply current to earth/water which is picked up by the structure, thus reversing the flow of current and stopping the corrosion process. This is called cathodic protection.

There are two main types of cathodic protection:

A) Galvanic anode system
B) Impressed current system

The type of cathodic protection utilizing galvanic anodes makes use of the voltage difference between the structure metal and the anode material. The anode is always more negative than the structure, therefore, the flow of current through the wire connection is from structure to anode and the flow of current through the electrolyte (that is, the earth or water) is from anode to structure. There are galvanic anodes made of different materials such as magnesium, zinc, and aluminum.

The impressed current type of cathodic protection makes use of a rectifier or other source of D.C. current. The current output from the D.C. source used is discharged to earth through sacrificial anodes. The current in turn is picked up by the structure in contact with the earth or water (providing cathodic protection in the process) and returns through cable connections to the negative terminal of the rectifier. Sacrificial anodes are made of diversified types of materials such as scrap metal, graphite, aluminum, lead-silver alloys, platinum, and a high-silicon alloy cast iron.

A structure-to-close-reference-electrode potential is the measurement of the potential (or voltage) difference between the structure and a reference electrode (normally a Copper-Copper Sulphate electrode) contacting the earth/water surface directly above or adjacent to the structure.

A structure-to-remote-reference-electrode potential is the measurement of the potential difference between the structure and a reference electrode contacting the earth/water surface well away from any metallic structures which may have adverse effects on the reading.

The general interpretation of a potential survey is as follows:

A) On an unprotected structure, the points on that structure which have the most negative potentials to a close and remote electrode are the ones where corrosion would be more active.

B) On a cathodically protected structure, an accepted corrosion control criterion is that if the structure has a potential measured to a close Copper-Copper Sulphate electrode which is more negative than 0.85 volt, that structure is adequately protected against most types of corrosion at that location.

C) On a cathodically protected structure, if the structure has a potential measured to a remote Copper-Copper Sulphate electrode more negative than 0.85 volt, the entire structure has all its unsealed areas protected against long-line current corrosion. Long-line currents are those caused by galvanic couples created by anodic and cathodic areas which are far apart. These could be caused by dissimilar soils, by earth magnetic currents, by foreign D.C. current sources, etc. A potential more negative than 0.85 volt to a remote electrode does not preclude, however, the possibility of corrosion due to localized action especially in shielded areas where very little or no current at all can be picked up by the structure.

4. Corrosion in Above Ground Structures

The process of corrosion in above ground structures is very similar to corrosion in underground structures, requiring the presence of an electrolyte which, in most atmospheric situations, is humidity or rain water. Cathodic protection, however, is useless for the protection of above ground structures due to the lack of a continuous electrolyte between the anodes and the structure, and only a good maintenance program using paints and coatings can eliminate or at least reduce corrosion in those areas in which the environment is corrosive, such as in areas close to the ocean.

VI. **Discussion of Results**

Soil resistivity measurements, that allow us to determine the aggressiveness of the soil environment, around the subject pipeline, were obtained both from soil samples taken from the two excavations and from adjacent soils using the Weiner 4-pin Method for obtaining soil resistivity from undisturbed soils. From the two excavations made this day, soil was taken from the excavation at pipe depth, at approximately mid point on the line. These samples were then transferred to an M.C.M. soil box, packed into the box and measured for resistivity using a Nelson Soil Resistivity meter. Resistivity measurements were recorded to be 25,000 ohm/cm from the Northern most excavation and 35,000 from the Southern most excavation. Using the Weiner 4-pin method, in an adjacent area near the excavations, resistivity was measured to be 26,000 ohm/cm and 34,000 ohm/cm respectfully. All soil resistivity measurements fell well above the 10,000 ohm/cm mark placing them in the progressively less corrosive category of soil resistivity.

Potential measurements, as referenced to a standard Copper/Copper sulfate reference electrode, were obtained at both pipeline excavations. These measurements were observed and recorded to be -0.445 at the Northern most excavation and -0.490 from the Southern most excavation. Both measurements, although a little low fall in the generally acceptable "normal" corroding potential range.

Stray current analysis was conducted while obtaining the above referenced potential measurements. While potential measurements were observed for approximately 10 minuets, no fluctuation in the observed measurements were found. With no fluctuation observed, at the time of testing, no adverse affect is expected from this type of influence.

With both excavations open and the pipe exposed, continuity tests were conducted to determine the resistance of this section of pipeline. With the piping suspected to have "Bell" & "Spigot" joints, it was unknown if there was any continuity between adjacent sections. The electrical resistance of the piping between the two excavations (approximately 150 feet) was recorded to be in excess of 1 million ohms. From this measurement it is assumed that rubber gaskets were used to connect the pipeline sections and no steps were taken to make the pipeline electrically continuous.

In addition to the above listed Corrosion testing, ultra sonic thickness readings were obtained from the pipeline in both excavations. At the Northern most excavation, the "plastic" pipe wrap was removed to allow for a good visual examination and direct contact to the pipeline surface. Facing South, pipe wall thickness readings were obtained at the 12 clock (every hour) positions. Measurements were observed and recorded to range from 0.800 mills to 0.670 mills, averaging about 0.700 mills, slightly less than 3/4 of an inch thick. At the Southern most excavation this procedure was repeated except that only a window of "Plastic" wrap was removed from the top of the pipe. This allowed us only a small porthole to view the pipeline but kept the original pipe wrap in place. Thickness measurements obtained at all other locations around the pipeline, were obtained with the "plastic" pipe wrap in place. Compensation was made for the additional thickness of the wrap and measurements adjusted accordingly. These measurements were observed and recorded to range between 0.790 mills and 0.710 mills, averaging about 75 mills, 3/4 of an inch thick. The "plastic" pipe wrap was measured to have a single sheet thickness of approximately 20 mills, approximately 1/32 of an inch. Several sheet thicknesses were found on the pipeline in both excavations. Pipe wall thickness measurements as observed and recorded during this testing are shown on our attached data sheets in the appendix of this report.

Pipe wall thickness measurements as obtained and recorded at both excavations indicate relatively uniform thickness around the circumference of the pipeline. From a visual observation of the piping at both excavations, the external surfaces of the Water Main appeared to be in excellent condition.

From a corrosion stand point, the results of the preceding corrosion testing, ultra sonic pipe wall thickness measurements and visual observations of the Water Main indicate that the pipeline appears to be good to excellent condition.

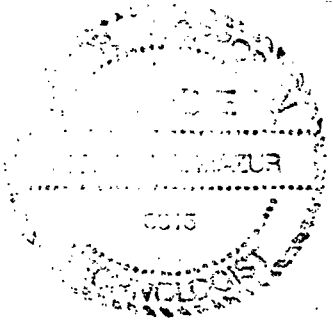
Although the Water Main appears to be in good to excellent condition within the physical limits of this survey/investigation it would be suggested that some consideration be given to installing sacrificial anodes to further prolong the useful life of this pipeline. From a corrosion engineering standpoint we would be remiss if we did not offer this for consideration.

VI. Recommendations

No special repair, maintenance and/or upgrading was found necessary at the time of this survey. Consideration is suggested for installing sacrificial anodes for corrosion control to prolong the useful life of this pipeline.

If there are any questions about this survey/ investigation, or if there are any items that need additional clarification, please feel free to call RAM SERVICES at (914) 986-5822 or fax us at (914) 986-5828.

RAM SERVICES appreciates this opportunity to be of service for you and looks forward to the next occasion when our specialized services will fit your needs.



Respectfully Submitted
RAM SERVICES

Richard A. Mazur
Corrosion Specialist

RAM SERVICES

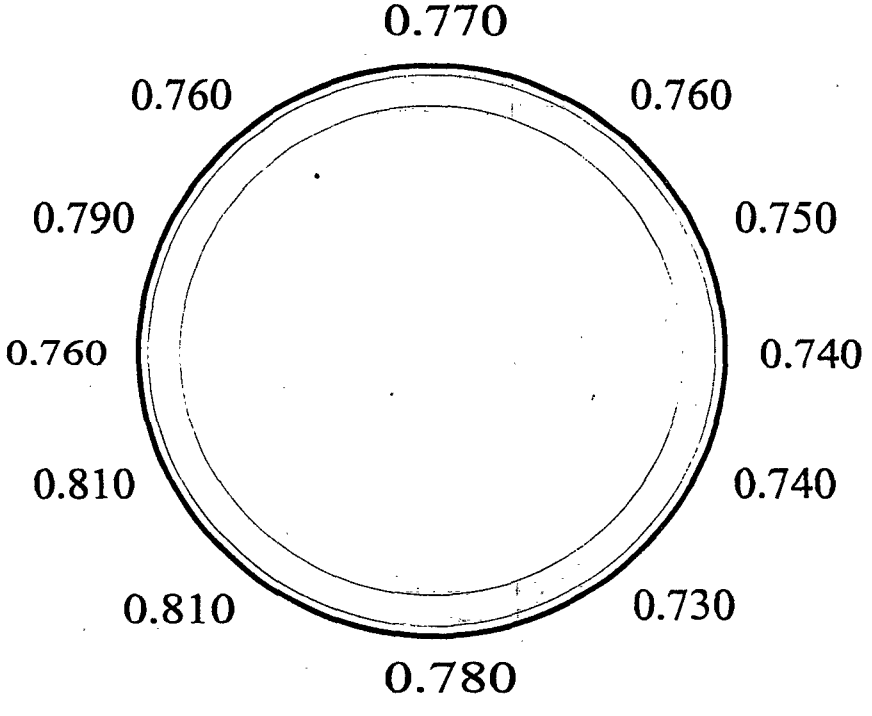
P.O. BOX 38
BELLVALE, NEW YORK 10912
(914) 986-5822
Fax (914) 986-5828

By : R.A.M.
Date: 01/02/96

Langan Engineering
River Drive Center 1
Elmwood Park, New Jersey

Job No. 0482-S
Sheet 1 of 3

16" Water Main
HALBY Chemical Site
Wilmington, Delaware



Ultra Sonic Pipe Wall Thickness Measurements
Northern Most Excavation
Looking South

Note; All Measurements in Inches

RAM SERVICES

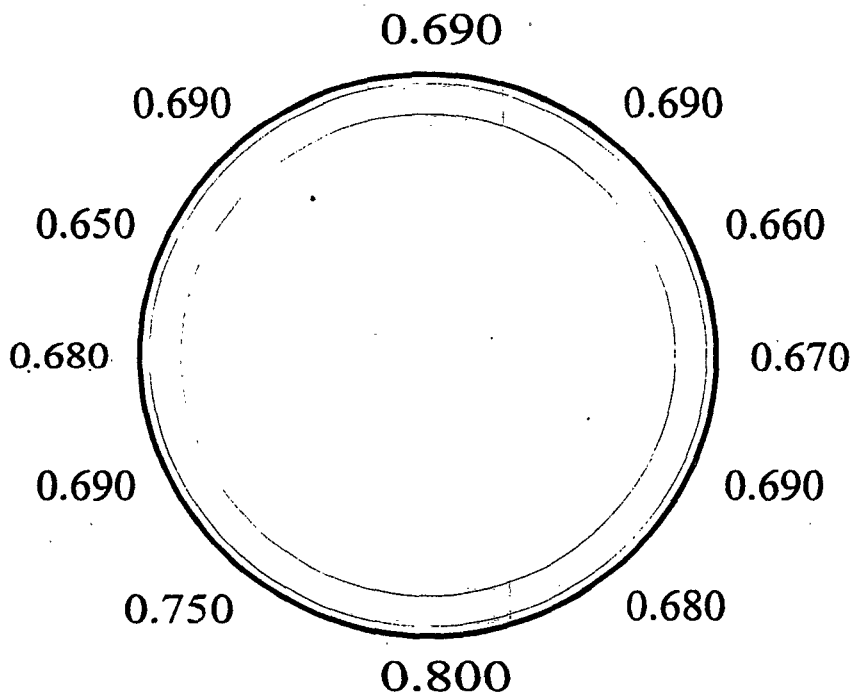
P.O. BOX 38
BELLVALE, NEW YORK 10912
(914) 986-5822
Fax (914) 986-5828

By : R.A.M.
Date: 01/02/96

Langan Engineering
River Drive Center 1
Elmwood Park, New Jersey

Job No. 0482-S
Sheet 2 of 3

16" Water Main
HALBY Chemical Site
Wilmington, Delaware



Ultra Sonic Pipe Wall Thickness Measurements
Southern Most Excavation
Looking South

Note; All Measurements in Inches

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P.O. BOX 38
BELLVALE, NEW YORK 10912
(914) 986-5822
Fax (914) 986-5828

By : R.A.M.
Date: 01/02/96

Langan Engineering
River Drive Center 1
Elmwood Park, New Jersey

Job No. 0482-S
Sheet 3 of 3

16" Water Main
HALBY Chemical Site
Wilmington, Delaware

At Excaxation 1, Northern Most;

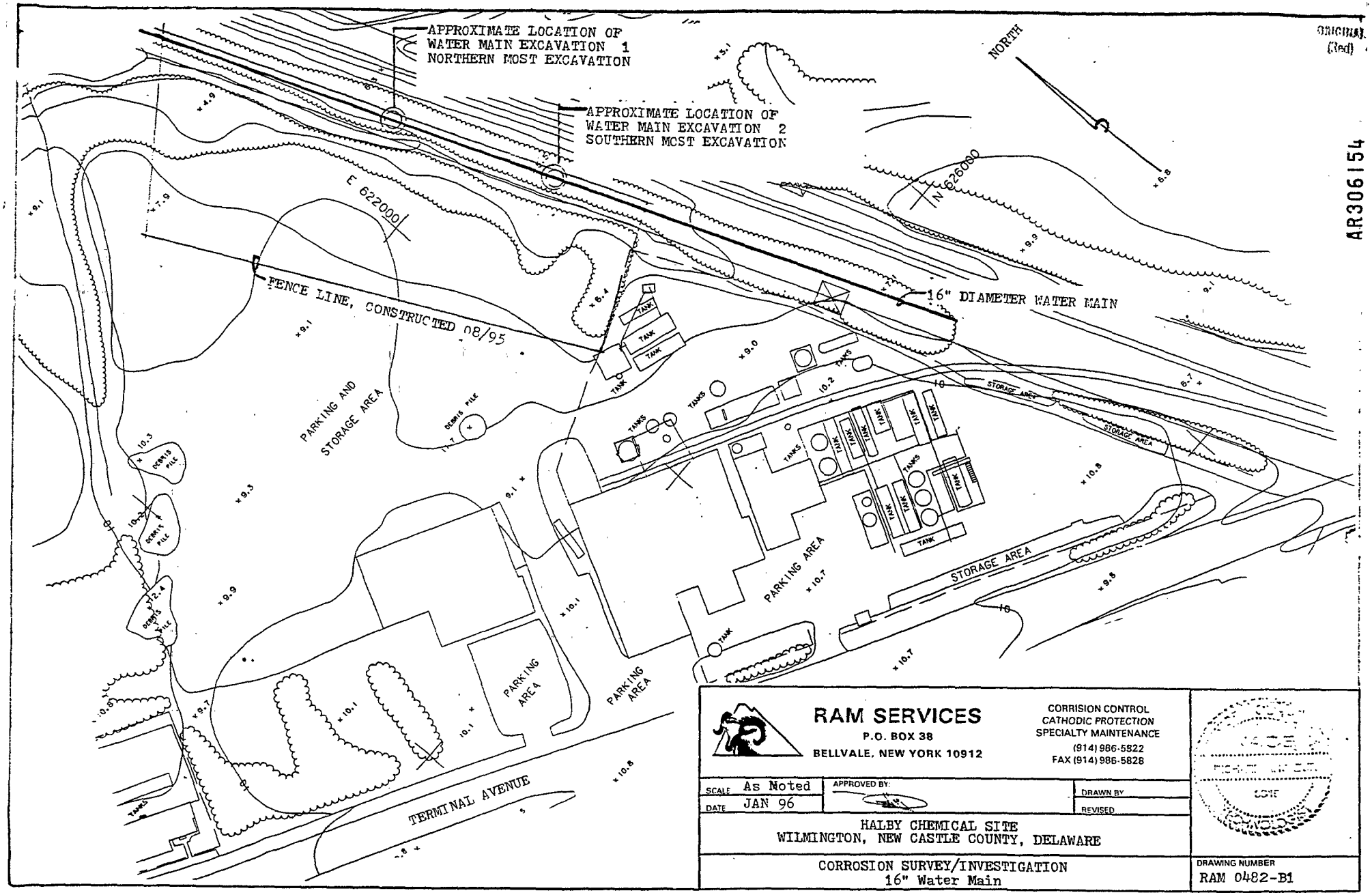
Soil Resistivity, Soil Box Method	25,000 ohm/cm
Soil Resistivity, Weiner 4-Pin Method	26,000 ohm/cm
Water Main Potential Measurement	-0.445 volts

No Stray DC Current Noted.

At Excavation 2, Southern Most;

Soil Resistivity, Soil Box Method	35,000 ohm/cm
Soil Resistivity, Weiner 4-Pin Method	34,000 ohm/cm
Water Main Potential Measurement	-0.490 volts

No Stray DC Current Noted.



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P.O. BOX 38
BELLVALE, NEW YORK 10912

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SCALE As Noted	APPROVED BY:	DRAWN BY
DATE JAN 96		REVISED

HALBY CHEMICAL SITE
WILMINGTON, NEW CASTLE COUNTY, DELAWARE

CORROSION SURVEY/INVESTIGATION
16" Water Main

DRAWING NUMBER
RAM 0482-B1

RAM SERVICES

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BELLVALE, NEW YORK 10912
(914) 986-5822

Corrosion Basics

Electrochemistry of Corrosion

While corrosion can take several forms, the mechanism of attack in aqueous solutions will involve some aspect of electrochemistry. There will be a flow of electricity from certain areas of a metal surface to other areas through a solution capable of conducting electricity, such as seawater or hard water.

The term *anode* is used to describe that portion of the metal surface that is corroded and from which current leaves the metal to enter the solution. On the other hand, the term *cathode* is used to describe the metal surface from which current leaves the solution and returns to the metal.

The *circuit* is completed outside the solution through the metal or through a conductor joining two pieces of metal. The essential components are shown in Figure 1. The dots represent electricity (not electrons) flowing in the solution from the anode (−) to the cathode (+) and returning from the cathode to the anode through the metal wires.

CORROSION CELL CURRENT FLOW

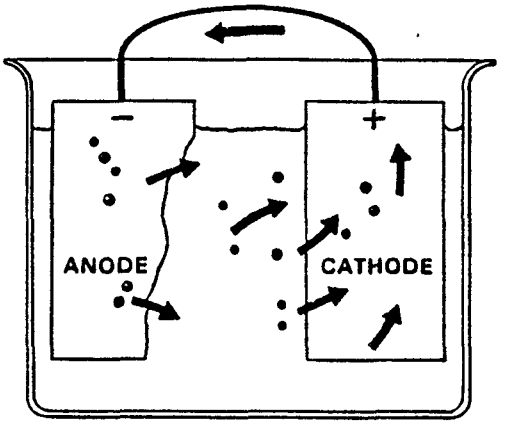


FIGURE 1 — Sketch showing flow of current between an anode and a cathode in a corrosion cell.

A solution capable of conducting electricity is called an *electrolyte*. Its ability to conduct electricity is due to the presence of ions. These are positively or negatively charged atoms or groups of atoms in solution. Pure water contains positively charged hydrogen ions (H^+) and negatively charged hydroxyl ions (OH^-) in equal concentration. The electrolyte forming a corrosive environment may be any solution, rain, or even moisture condensed from the air. It can range from fresh water or salt water to the strongest alkali or acid.

The anodes and cathodes involved in a corrosion reaction are called *electrodes*. The electrodes may consist of two different kinds of metal or they may be different areas on the same piece of metal. The

CAST IRON PIPE

DESIGN • ENVIRONMENT • LIFE

By W. Harry Smith, P.E.
(President)
Cast Iron Pipe Research Association

Life of cast iron pipe is assured through proper design, including consideration of environment, and operation of pipelines within design limits. Recent research has resulted in effective environmental control systems.

The longevity of cast iron pipe, both gray and ductile, is assured through qualities inherent in the pipe material, adequacy of design, knowledge of environmental factors, and operation of pipelines within the limits of design. The Cast Iron Pipe Research Association (CIPRA) is committed to research on the pipe and its environment. This paper presents information on past performance and introduces results of research on existing pipe and various pipe environments.

Considerable improvement in cast iron pipeline performance has been accomplished in recent years through the following changes:

a) More rigid design standards
b) Higher unit strengths
c) Precise quality control in manufacturing
d) Improved shipping methods
e) Improved pipe joints
f) Modern construction techniques
g) Environmental studies and corrosion control techniques

As the study of human ecology has been enhanced by (and at the same time partly responsible for) the dramatic increase in life expectancy, so has the long life of existing cast iron pipe permitted observance of past performance and development of the improvements listed above.

Studies of gray and ductile cast iron pipe in service have revealed that

a) Cast iron pipe provides service life in excess of need in almost all soil environments.
b) Past failures which have occurred in gray cast iron pipe may be related to one or more of the following:
   1. Impact damage before or during construction
   2. Loads grossly exceeding design criteria
   3. Disturbance of foundation of pipe
   4. Uneven bearing
   5. Sulfur compound joints
   6. Corrosion in extremely aggressive soils
c) Total experience of gray cast iron pipe in water systems of the United States is successful.
d) Ductile iron pipe, in view of the virtual absence of failures in over 20 years of service, is expected to serve even more successfully than has gray cast iron pipe.

Life Expectancy

Through knowledge of cast iron pipe environment and strict application of good design, construction and operational techniques, adequate life expectancy can be assured. During June and July, 1970, Engineers of CIPRA interviewed water utility executives in cities in each of the continental United States. These cities were selected at random with the exception that the state capital was represented in almost all cases. Those interviewed based any estimates on experience and all had intimate knowledge of their piping systems. Gray and ductile iron pipe reported served at internal pressures ranging from about 20 psi to 240 psi, not including surge pressures. Pipe age varied from new pipe to 149 years. Of the pipe reported, less than .1% was provided with any type of external protection.

Reprinted (with revisions) from the Journal of the New England Water Works Association, Vol 84, No 4 1970, where it appeared under the title, "Recent Technological Advances in the Cast Iron Pipe Industry"

States reported	48
Cities reported	229
Miles of gray cast iron pipe	101,056
Miles of ductile iron pipe	2,076
Total miles of gray and ductile iron pipe*	121,509
Percentage not affected by corrosion	94.98%

Cast Iron Pipe Design

The design of gray cast iron pipe is controlled by AWWA H1 (ANSI Standard A21.1(1)). This Standard for a rigid pipe structure includes consideration of the character of the trench into which the pipe will be installed; external loads, including earth backfill, traffic and impact loads; and internal loads, including working pressure and surge or water hammer. Each pipe is designed assuming that traffic superload and surge pressure will not occur in important magnitude simultaneously. Otherwise the loads are considered in combination and a safety factor of 2.5 is applied to the total. Corrosion allowance and foundry tolerances are added to the design wall thickness, making the total procedure extremely conservative.

Ductile iron pipe design is governed by AWWA H3 (ANSI Standard A21.50(2)). In this Standard the same external and internal loads are considered; however, they are calculated separately because of the ductility offered by the pipe material. The design method is conservative because it does not take advantage of the rerounding influence of internal pressure. Ring deflection is limited to 2% of the pipe diameter, which for cement-lined pipe is well below the deflection that might damage the lining.

In designing ductile iron pipe for installation in a flat-bottom trench with tamped backfill, a modulus of soil reaction (E') of 300 and a bedding angle of 30° are used. While these criteria are conservative, it has been found that larger values cannot be achieved along 100% of any proposed pipeline.

Evaluation of Environment

During the years 1967 through 1969, as an assistance to consulting engineers, CIPRA studied soil characteristics along approximately 840 miles of proposed cast iron pipe installations in soils of questionable character. Of the soil studied, over 90% was determined to be noncorrosive to cast iron pipe.

In 1967, CIPRA presented a system for the evaluation of soil as related to potential corrosion of cast iron pipe (3). Table I below lists the soil analyses accomplished at each test location together with points of importance for the various ranges of results:

Table I
Soil Test Evaluation

Factors	Range	Points*
Resistivity (ohm-cm)	<700	10
	700—1000	8
	1000—1200	5
	1200—1500	2
	1500—2000	1
	>2000	0
pH	0—2	5
	2—4	3
	4—6.5	0
	6.5—7.5	0**
	7.5—8.5	0
	>8.5	3
Oxidation-Reduction Potential	>100 mv	0
	50—100 mv	3.5
	0— 50 mv	4
	Negative (—)	5
Sulfides	Positive (+)	3.5
	Trace	2
	Negative (—)	0
Moisture	Poor drainage, continuously wet	2
	Fair drainage, generally moist	1
	Good drainge, generally dry	0

* A total of ten points indicates that the soil is corrosive to cast iron pipe
** If sulfides are present and low or negative oxidation-reduction potential results are obtained, three points shall be given for this range

This system has been in use for nine years, during which many observations of pipe condition have been recorded along with analysis results. The system is ade-

*Some were not reported separately.

quate and accurate in over 99% of the sites studied and it is proposed to continue its use, bearing in mind that there are exceptions which involve certain man-made contaminants and occasional stray direct currents.

Expansive Soils

Included in the evaluation of environment is consideration of the potential swell pressure of clay soils and the effect soil expansion might have on the pipe structure. Clay samples are collected from the subject soil at a level approximating proposed pipe depth and again beneath proposed pipe depth. It is probable that expansive soils (those that swell or shrink upon gain or loss of moisture) can influence external loads on the pipe structure. Damage could result from beam loads, joint separation, or ring crushing loads.

The collected samples are subjected to tests using a soil PVC Meter as developed by Dr. T. William Lambe of the Massachusetts Institute of Technology. Tests provide information on swell index which is correlated with a potential volume change rating and category and an approximate plasticity index. Swell index is reported in pounds per square foot and is a very close approximation of swell pressure exerted by a sample of compacted soil as it swells against a restraining force after being wetted.

Results indicate that most clays exhibit swell pressures to some degree, the most expansive being Montmorillonite, often found in the South and Southwest regions of the United States. The importance of the influence of swelling clay on pipe structures may lie in the degree of variance in soil moisture in a given area.

Current plans call for development of tests on gray and ductile cast iron pipe in clays which are known to be expansive and upon which swell pressures have been observed to be significant. Through the use of pressure cells and observance of deflection, the importance of soil expansion can be determined. Pilot studies were completed during the year 1971, and field studies are in progress.

Some swell test results are listed in Table II.

Table II

Location	Swell Index lb./sq. ft.
College Station, Texas	14,725
New Braunfels, Texas	13,050
Honolulu, Hawaii	14,592
Detroit, Michigan	7,200
Miami, Oklahoma	7,200
Orange, California	9,150
Vincennes, Indiana	1,250
Massillon, Ohio	5,570
Clinton Township, Michigan	6,725
Charlotte, North Carolina	6,150
North St. Paul, Minnesota	2,175
St. Charles, Missouri	13,950
Oakland, California	6,070
Medinah, Illinois	6,245
Dallas, Texas	9,190
Jefferson County, Missouri	8,604
Fairfax, Virginia	6,000
Montgomery, Alabama	9,000
Denver, Colorado	7,600

Corrosion Prevention

Because of the electrical discontinuity resulting from rubber-gasketed joints universally used for gray and ductile cast iron pipe, long line currents do not present a serious hazard. The major hazards are from stray direct current and from soil characteristics which are conducive to local cell corrosion. Any protective system must be designed to withstand local cell corrosion first. If stray currents are involved, it must also have the capability to effectively shield cast iron pipe, thus keeping interference to a minimum.

Early use of loose polyethylene encasement on cast iron pipe in corrosive environments indicated this procedure to be effective against both types of corrosion mentioned above. Continuing studies have confirmed this. Surveillance and inspection of cast iron pipe with loose polyethylene encasement have been accomplished in a number of water and utility systems across the country.

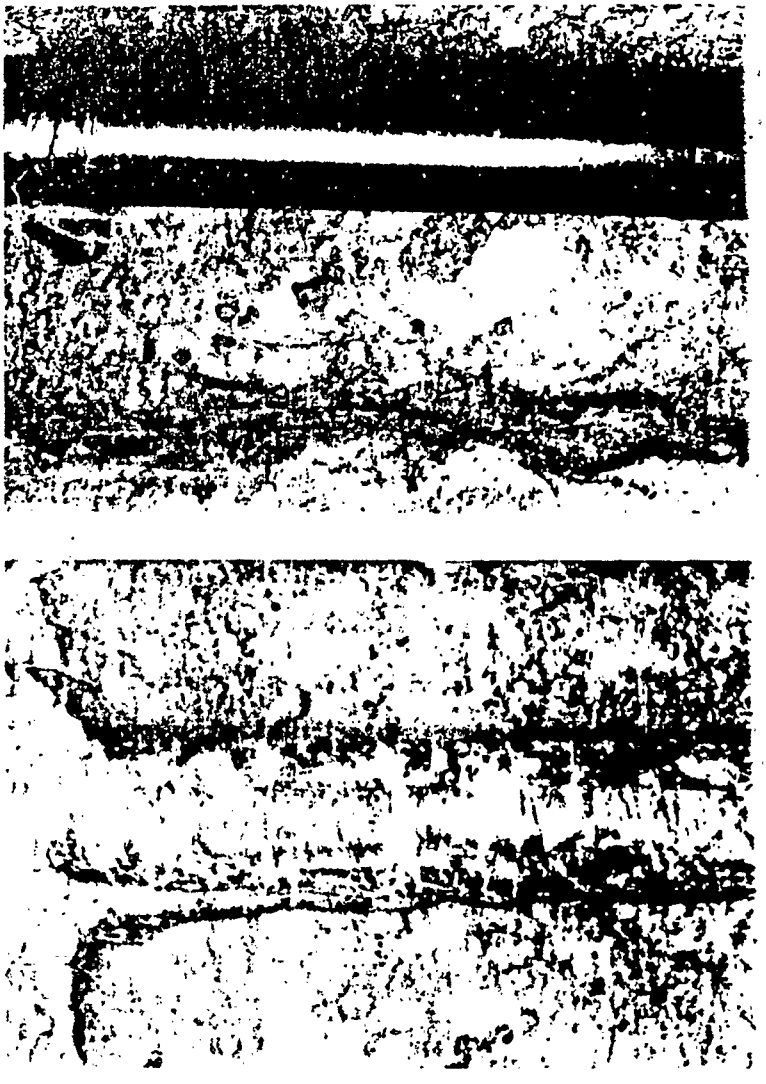
A few examples are:

Figure 1

San Diego, California, where 12-inch and 16-inch cast iron pipe, polyethylene-wrapped, was installed in severely corrosive low resistivity (300 to 500 ohm-cm), anaerobic, sulfate-bearing soils in 1960. Repeated inspections at several locations on this pipeline have shown virtually no corrosion pitting to date.

Figure 2

In Philadelphia, Pennsylvania, 12-inch cast iron pipe, polyethylene-wrapped, was installed in a waste dump area in 1959. Inspection of a considerable length of this pipe in 1969 revealed no significant corrosion attack.



Inspections of operational cast iron pipelines protected by 8-mil, loose polyethylene wrap in several other water utility systems have shown equally good results.

The photo, taken in Detroit, Michigan, shows 6-inch cast iron pipe, polyethylene-wrapped, in soil where cast iron had previously failed due to corrosion. After five years' exposure, inspection revealed no corrosion attack.

Figure 3

This protection system is in use in several hundred water utility systems in the United States, mostly where small areas of severely corrosive soil environments were found. To date, no failure has been recorded nor has any significant corrosion attack been observed.

An important advantage of loose polyethylene encasement is the extremely low cost of material and application. In a 1969 project, 28 miles of 16-inch and 18-inch ductile iron pipe was thus protected. Total cost of protection was 1% of project cost.* Considering the high degree of protection afforded, this is a very economical system which allows the design engineer to be conservative with no significant increase in total job cost.

Several researchers have confirmed the validity of loose polyethylene encasement and their statements

*This figure represents cost in 1970

are quoted below:

Donald A. Hoffman and F. O. Waters, (4) "Materials Protection," May, 1966:

"The San Diego Utilities Department has found that the best way to prevent cast iron corrosion is through the use of polyethylene jackets."

D. R. Whitchurch and J. G. Hayton, (5) International Conference on Corrosion and Protection of Pipes and Pipelines, London, England, June, 1968:

"The use of polyethylene sleeving has proved to be a cheap and efficient means of providing protection for iron pipes buried in aggressive soils. It does not suffer any significant change in its physical properties when buried in the ground. Minor punctures in the sleeving are less critical than similar damage would be with an adherent plastic coating and it can, in any case, be readily repaired on site. There are no difficulties in its practical application."

Atlee Cunningham, (6) 50th Texas Water & Sewage Works Association, March, 1968:

". . . 7,000 feet of 16-inch pipe was rehabilitated by excavating, cleaning, wrapping and partially embedding in sand. During the eight years of exposure of the pipe, as installed by the Water Division with polyethylene wrap, the metal has suffered no external damage."

J. Nekoksa (7) (Czechoslovakia), verbal statement at International Conference on Corrosion, London, England, June, 1968:

"At the moment there are about 20 kilometers of pipes with plastic sleeves or wrapping laid in Czechoslovakia in stray current areas. The diameters of the pipes range from 100 to 1,200 mm. At present, no corrosion has been detected on the samples or on the laid pipes."

Durability of Polyethylene

Polyethylene film or sheet has been commercially available for about 25 years. Its life expectancy must be based on an extrapolation of experience to date. In 1963, E. F. Wagner (8) reported on eight years' underground exposure of polyethylene in service as cast iron pipe protection in extremely corrosive environments. Not only did the polyethylene adequately protect the pipe under study, but analysis of the wrap showed insignificant loss of strength and other physical characteristics.

Inspection of a ten-year-old installation in Philadelphia again revealed excellent protection of the cast iron pipe. Analysis of the polyethylene showed average tensile strength and elongation greater than standard minimum requirements.

Studies by the Bureau of Reclamation on polyethylene sheeting used underground in lining canals showed that tensile strength was nearly constant in a seven-year test period and that elongation was only slightly affected. The Bureau's accelerated soil burial testing (acceleration estimated to be five to ten times that of field conditions) showed polyethylene to be highly resistant to bacteriological deterioration. In United States Department of Interior, Bureau of Reclamation Report No. ChE-82, (9) it is stated:

"Buried membrane linings of PVC and polyethylene plastic in use ten years are giving excellent performance."

Stray and Impressed Current Studies of Polyethylene-Wrapped Cast Iron Pipe

During June, 1968, CIPRA placed a test installation in operation in southern Nevada. The test installation is designed to carry out survival and other performance studies on polyethylene protected and unprotected gray and ductile cast iron pipe in a severely corrosive soil with the presence of high levels of impressed electrical earth currents.

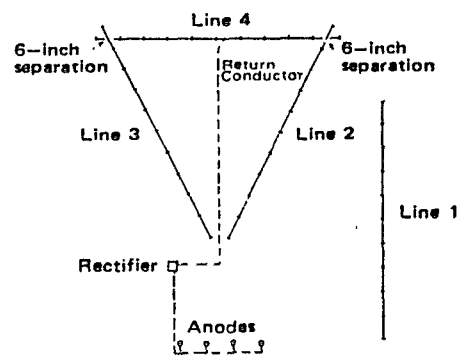


Diagram - C.I.P.R.A. Nevada Test Site

Figure 4

As shown in Figure 4, the test installation involves four separate pipelines, each composed of ten alternate 18-foot lengths of 6-inch, Class 22, gray and 6-inch Class 2 ductile cast iron pipe. The pipe is of standard manufacture, cement-mortar-lined with a standard bitu-

minous external shopcoat. All joints are push-on type.

Lines 2 and 4 are encased in 8-mil thick, loose-fitting polyethylene tube material. Lines 1 and 3 have no external protection. All lines have test leads attached to each end of each length of pipe. Line 4 also has electrically bonded joints.

Line 4, with polyethylene encasement, receives cathodic protection current from a rectifier and anodes. Line 2, with polyethylene encasement, and Line 3, unprotected, are located in the path of the impressed current from the rectifier and anodes. Line 1, unprotected, is located out of the path of the impressed current to serve as a control line for comparison.

The rectifier output can be adjusted to any desired level in both voltage and amperage. Voltage levels can be set between 0 and 200 volts while amperage can be independently adjusted between 0 and 12 amperes. The infinite variation of output permits great flexibility in the test procedures.

Soils at the test site are severely corrosive, having a resistivity range of 190 to 200 ohm-cm, a pH range of 7.8 to 8.0 and poor aeration and drainage (saturated at pipe depth).

Test results to date indicate:

1. The loose-fitting polyethylene tube material can provide very effective corrosion protection for gray or ductile cast iron pipe without the aid of cathodic protection.
2. The loose-fitting polyethylene tube material encasing the pipe with unbonded joints also appears to be an effective barrier to stray electrical currents when the encased pipe is not an actual part of the stray electrical current circuit. Such protection under these conditions may be effective to near a 50-volt potential level but additional tests are needed for more accurate determination.
3. Joints of cast iron pipe wrapped in polyethylene retain more of the original electrical resistance than those not so encased.
4. Cathodic protection of pipe encased in the polyethylene tube material is easily achieved with low current density. This refutes the theory to the contrary stated in "Corrosion as a Primary Cause of Cast-Iron Main Breaks" (10) by John H. Fitzgerald III, Journal AWWA, August, 1968.
5. A current density of 25 x 10^{-6} amps provided a pipe-to-soil potential of −.85 to −.90 volts (after stabilization) on the polyethylene-encased Line 4 under cathodic protection. This value compares favorably with test results obtained by Hertzberg and Westerback, "Comparison Tests of Steel Pipe Coatings," (11) Journal AWWA, July, 1969.
6. The loose-fitting polyethylene tube material appears not to be affected by high over-voltage applied to the pipeline under cathodic protection. (A pipe-to-soil potential of −14.6 volts was maintained for six months.)

Material Requirements for Polyethylene

Shown in Table III below are minimum requirements for polyethylene for use as loose encasement on underground gray or ductile cast iron pipe:

Table III
MATERIAL REQUIREMENTS FOR POLYETHYLENE FOR USE AS LOOSE ENCASEMENT ON UNDERGROUND GRAY OR DUCTILE CAST IRON PIPE*

NOTE: These specifications constitute minimum standards. Polyethylene material surpassing these standards in any or all respects would be acceptable.

Thickness	8 mils minimum
Type, Class, Grade, other Characteristics	In accordance with A.S.T.M. Specification D-1248-72 or latest revision thereof.
Type	I
Class	A. Natural Color OR C. Black Prolonged exposure to sunlight will eventually deteriorate polyethylene film. Therefore, such exposure prior to backfilling the wrapped pipe should be kept to a minimum. If several weeks of exposure prior to backfilling is anticipated, Class C material should be used.
Grade	E-1
Flow Rate (formerly Melt Index)	0.4 maximum
Tensile Strength	1200 psi minimum
Elongation	300% minimum
Dielectric Strength	Volume resistivity, minimum ohm-$cm^3 = 10^{15}$; 800 volts per mil thickness minimum

*ANSI A21.5 (AWWA C-105)

Potential Corrosion of Cast Iron Pipe from High Voltage Direct Current (HVDC) Transmission

In order to evaluate potential stray direct current corrosion of cast iron pipe which might result from long-distance transmission of direct current, CIPRA has studied cast iron pipe in water distribution systems near the electrodes of the Pacific Northwest-Southwest Power Intertie in Oregon and California. In this direct current transmission project, one 750,000 volt direct current line extends from The Dalles, Oregon, to Santa Monica, California. This study of cast iron pipe involved recording pipe-to-soil potentials at many locations in The Dalles, and in Santa Monica and Pasadena, California, water distribution networks. Initial tests are complete. A portable rectifier transmitting about 300 amperes at 3,000 volts through the earth was operated intermittently in June, 1969. At 16 locations (14.8%) pipe-to-soil potential was influenced in a range of approximately 5 mv. At the remaining locations (85.2%) no interference was recorded. In future testing at higher current levels, cast iron pipe will be checked at those locations indicating minor interference, and current on the pipe will be determined. At that time the significance of the influence of the HVDC system can be appraised.

It appears that those cast iron pipelines which have rubber-gasketed joints (mechanical joint or push-on) are generally free of influence. It is likely that the joint resistance provides interruption to the extent that direct current does not accumulate on the pipeline and that stray current on a single length of cast iron pipe is so small that it cannot be recorded.

Ductile Iron Pipe

Results of comparative testing of gray and ductile cast iron pipe in severely corrosive soils have been published previously. These results showed that the soil corrosion resistance of ductile iron pipe is equal to or somewhat better than that of gray cast iron pipe. The corrosion products of ductile iron pipe are similar in nature to those of gray cast iron pipe with strength and adherence equal to those of gray cast iron pipe.

The manufacturer Pont-a-Mousson of France studied corrosion rates of both materials in sea water, sulfuric acid, and several other corrosive mediums, including soils. Pont-a-Mousson's conclusion—"Gray iron and ductile iron have analogous rates of corrosion . . ."

The twenty years' service experience with ductile iron pipe in water distribution and transmission systems in the United States is unequalled by any other pipe material. To date there have been no reported failures of ductile iron pipe due to trench conditions, earth or truck loads, water pressure or water hammer. One failure occurred when the cathodic protection system serving a petroleum pipeline induced high levels of stray current on ductile iron pipe. This could have been prevented easily and inexpensively by using economical protection.

Importance of Pipe Wall Thickness

Back in the days when comparatively little was known about metallurgy, corrosion, soil environment and even structural design, it was necessary to provide very thick walls in gray cast iron pipe to afford enough safety factor to handle all the unknowns. Now, however, with the vast knowledge that is available in each of these areas, it is neither necessary nor economical to provide wall thickness in excess of design requirements to allow for contingent factors, such as potential corrosion.

The only logical approach to modern pipe design includes the following:

1. Establish design criteria (applicable to any or all pipe materials).
2. Develop knowledge of the proposed pipe environments (from experience or study).
3. Protect the pipe from any severe environmental factors. (Generally the percentage of cast iron pipe requiring special protection will be minimal.)

CIPRA studied the relationship between wall thickness, soil environment, and corrosion experience. Based on observations to date, it is concluded that gray and ductile cast iron pipe wall thicknesses available commercially are adequate for most soils in the United States without special corrosion protection.

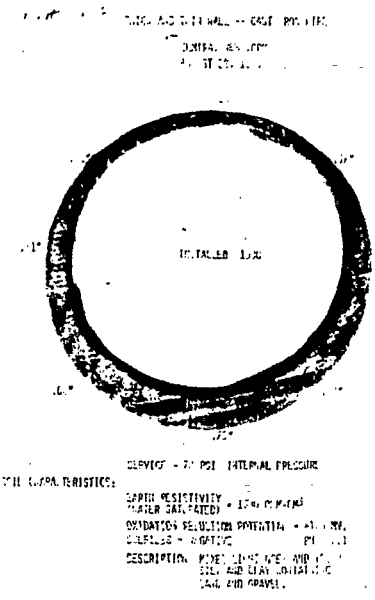


Figure 5

As an example, cast iron pipe installed in Elmira, New York, in 1900, and removed in August of 1968, showed no discernible corrosion attack in soil with an earth resistivity of 1300 ohm-cm. This was 6-inch pipe having thick and thin walls (.75 inches on the thick side and .28 inches on the thin side) resulting from displacement of the core during static casting. This pipe operated satisfactorily at 70 psi.

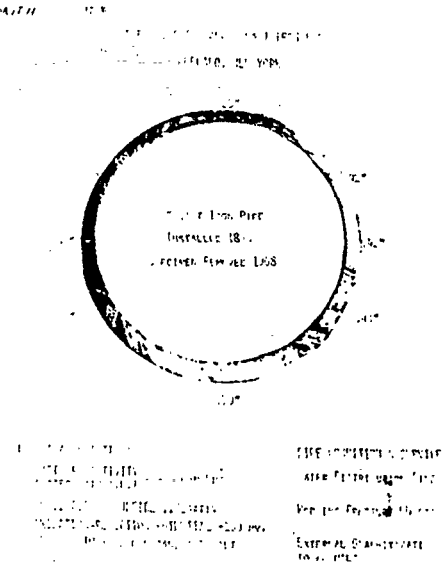


Figure 6

At Buffalo, New York, 6-inch thick and thin statically cast pipe installed in 1890 and removed in 1968 showed a wall thickness varying from .50 inches to .25 inches. External graphitization to a depth of 70 mils was noted. However, the pipe was performing satisfactorily under a water working pressure of 60 psi.

Summary & Conclusions

1. Over 400,000 miles of gray and ductile cast iron pipe now serve the water utility industry in the United States. Almost all of this pipe is serving adequately and well. Engineering and technological advances of recent years assure that present and future installations of cast iron pipe will serve even better.
2. Soil evaluation procedures, including corrosion and expansive soil considerations, are established.
3. If a soil environment is known to be corrosive, cast iron pipe should be protected with loose polyethylene encasement. If the soil is merely suspected to be corrosive, it should be studied. In those areas shown to be corrosive, protect the pipe.
4. Polyethylene wrap is proven adequate corrosion protection for cast iron pipe and does not lose its strength characteristics in underground service.
5. Performance of polyethylene-wrapped pipe in stray and impressed current tests is reported.
6. Initial test results of the effect of HVDC transmission are summarized.
7. Relationship between cast iron pipe wall thickness and corrosion is established.
8. Desired service life of gray and ductile cast iron pipe can be assured by the following:
   a) Manufacturing under rigid quality control, and proof testing of the finished product.
   b) Designing on the basis of logical criteria established prior to materials selection.
   c) Protection against unusual or severe environmental factors which might affect pipe performance or life.
   d) Operation of pipelines within the limits of their design.

References

1. American National Standards Institute, Inc., Standard A21.1 for Thickness Design of Cast-Iron Pipe
2. American National Standards Institute, Inc., Standard A21.50 for Thickness Design of Ductile-Iron Pipe
3. Smith, W. Harry. "Soil Evaluation in Relation to Cast-Iron Pipe." J. American Water Works Association, 60, No. 2, 221 (1968) February
4. Hoffman, Donald A. and Waters, F. O. Materials Protection (1966) May
5. Whitchurch, D. R. and Hayton, J. G. Proceedings of International Conference on Corrosion and Protection of Pipes and Pipelines, London, England (1968) June
6. Cunningham, Atlee. "Pipe Protection with Polyethylene and Sand Embedment," 50th Texas Water and Sewage Works Association Short School (1968) March
7. Nekoksa, J. Proceedings of International Conference on Corrosion and Protection of Pipes and Pipelines, London, England (1968) June
8. Wagner, E. F. "Loose Plastic Film Wrap as Cast Iron Pipe Protection," J. American Water Works Association, 56, No. 3, 361 (1964) March
9. Hickey, M. E. "Laboratory and Field Investigations of Plastic Films as Canal Lining Materials Open and Closed Conduits Systems Program," Laboratory Report No. ChE-82, United States Department of the Interior, Bureau of Reclamation, Denver, Colorado, (1968) September
10. Fitzgerald, John H., III. "Corrosion as a Primary Cause of Cast-Iron Main Breaks," J. American Water Works Association, 60, No. 8, 882 (1968) August
11. Hertzberg, Lee B. and Westerback, Arne E. "Comparison Tests of Steel Pipe Coatings," J. American Water Works Association, 61, No. 7, 343 (1969) July

APPENDIX D
CLEAN FILL CERTIFICATION AND RECEIPTS

PARKWAY GRAVEL, INC.

Parkway Gravel, Inc.
4048 New Castle Avenue
New Castle, DE 19720

302 / 658-5241
Fax / 658-0871

May 28, 1996

Code Environmental Services Inc.
400 Middlesex Avenue
Carteret, NJ 07008

Attention: Mr. Alex Madonna.

Reference: Holby Chemical, 600 Terminal Avenue, Wilmington De.

Dear Mr. Madonna:

This letter is to certify that the Select Borrow, Type 'G' excavated from River Road Extraction Facility and used on the Project noted above, meets Delaware Department of Transportation Specifications and is excavated from Virgin soil.

Very truly yours,

PARKWAY GRAVEL INC.

Vincent N. Greggo
Vice President

VNG:mlk

cc: file

Post-it® Fax Note 7671	Date 5-28-96 # of pages ▶ 1
To Paul McAndrew	From Alex Madonna
Co./Dept.	Co.
Phone #	Phone # 908-469-2700
Fax # 201-794-0366	Fax #

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288251

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:53:40-12/28/95

Sold to: CODE ENVIRONMENTAL COD

Ad:

Deliver to: 600 TERMINAL AVE 600

LECT/RIVER RD.

	LBS.	TONS
GROSS	70000	35.00
TARE	31440	15.72
NET	38560	19.28

#185 -COULSON #185

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 1 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288278

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	12:46:21-12/28/9

Sold to: CODE ENVIRONMENTAL COD

Address:

Deliver to: 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	66580	33.29
TARE	31440	15.72
NET	35140	17.57

GF #185 -COULSON #185

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 2 Rec'd by

AR306168

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 | OFFICE 658-5241

No. 0288287

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:04:39-12/28/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68060	34.03
TARE	21000	10.50
NET	47060	23.53

TH CONTRACTORS --ANTHONY TH #2

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER 057

LOAD # Rec'd by W. Daly

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 | OFFICE 658-5241

No. 0288294

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:31:37-12/28/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.	TONS
GROSS	74300	37.15
TARE	31440	15.72
NET	42860	21.43

GF #185 --COULSON #185

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER 057

LOAD #- .4 Rec'd by T Behris

AR306169

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288300

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:51:05-12/28/95

Sold to: CODE ENVIRONMENTAL COD

Address:

Deliver to: 600 TERMINAL AVE 600

T/RIVER RD.

	LBS.	TONS
GROSS	66660	33.33
TARE	21000	10.50
NET	45660	22.83

H CONTRACTORS -ANTHONY TH #2 3F -186

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 5 Rec'd by T Sikes

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288306

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:13:31-12/28/9

Sold to: CODE ENVIRONMENTAL COD

Address:

Deliver to: 600 TERMINAL AVE 600

SELECT - TYPE G/RIVER RD

	LBS.	TONS
GROSS	71320	35.66
TARE	31300	15.65
NET	40020	20.01

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 6 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288308

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:15:38-12/28/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68060	34.03
TARE	31440	15.72
NET	36620	18.31

#136 -COULSON #185

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 7 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288314

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:29:05-12/28/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	69540	34.77
TARE	28060	14.03
NET	41480	20.74

-GF TRUCK #176

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 8 Rec'd by

AR306171

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288318

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:35:48-12/28/95

Sold to CODE ENVIRONMENTAL COD

Address

Deli 600 TERMINAL AVE 600

T/RIVER RD.

	LBS.	TONS
GROSS	71020	35.51
TARE	21000	10.50
NET	50020	25.01

CONTRACTORS -ANTHONY TH #2

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD #- 9 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288319

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:39:35-12/28/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68700	34.35
TARE	28460	14.23
NET	40240	20.12

-GF TRUCK #1177

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD #- 10 Rec'd by

AR306172

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288321

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:56:08-12/28/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	69760	34.88
TARE	31360	15.68
NET	38400	19.20

F #188 -188 LEWIS

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

OAD #- 11 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288322

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	14:59:06-12/28/

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	66340	[illegible]
TARE	25000	[illegible]
NET	41340	[illegible]

GF -183 EASSETT

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: [illegible]57

LOAD #- 12 Rec'd by

AR306173

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288323

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	15:00:21-12/28/95

Sold to CODE ENVIRONMENTAL COD

Ad

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	67840	33.92
TARE	28240	14.12
NET	39600	19.80

-GF TRUCK # 173

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 13 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288324

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	15:01:54-12/28/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	69860	34.93
TARE	31440	15.72
NET	38420	19.21

GF #185 -COULSON

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 14 Rec'd by

AR306174

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. [illegible]

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	7:31:08-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 500 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70220	35.11
TARE	28440	14.22
NET	41780	20.89

-GF TRUCK # 178

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 1 Rec'd by W. Duffy

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288340

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	7:32:09-12/29/

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 500 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70000	35.00
TARE	31300	15.65
NET	38700	19.35

GF 184 -MATHIS #184

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK NUMBER: 057

LOAD #- 2 Rec'd by W. Duffy

AR306175

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288341

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	7:32:44-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	65380	32.69
TARE	29240	14.62
NET	36140	18.07

-GF TRUCK # 171

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # 3 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288342

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	7:33:28-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70540	35.27
TARE	31360	15.68
NET	39180	19.59

GF #188 -188 LEWIS

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # 4 Rec'd by

AR306176

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288311

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	7:34:13-12/29/95

Sold to CODE ENVIRONMENTAL .COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70000	35.00
TARE	31300	15.65
NET	38700	19.35

-187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD #- 5 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288346

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:12:04-12/29/9

Sold to CODE ENVIRONMENTAL .COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70980	35.49
TARE	31360	15.68
NET	39620	19.81

GF 5188 -188 LEWIS

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD #- 6 Rec'd by

AR306177

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288350

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:42:01-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

D 600 TERMINAL AVE 600

ELECT/RIVER RD

	LBS.	TONS
GROSS	68540	34.27
TARE	29240	14.62
NET	39300	19.65

-GF TRUCK # 171

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 067

LOAD # - 7 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288354

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:43:22-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

ELECT/RIVER RD.

	LBS
GROSS	70000
TARE	31300
NET	38700

GF 134 -MATHIS

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 067

LOAD # - 8 Rec'd by

AR306178

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288355

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:43:47-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

E CT/RIVER RD.

	LBS.	TONS
GROSS	71660	35.83
TARE	31300	15.65
NET	40360	20.18

-186

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD #- 9 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288356

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:44:21-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	72580	36.29
TARE	31300	15.65
NET	41280	20.64

GF -187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD #- 10 Rec'd by

AR306179

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 3288357

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:44:56-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70060	35.03
TARE	28440	14.22
NET	41620	20.81

-GF TRUCK # 178

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 11 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 3288360

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:46:58-12/29/

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	71440	35.72
TARE	31360	15.68
NET	40080	20.04

GF #188 -188 LEWIS

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 12 Rec'd by

AR306180

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288361

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:47:29-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68560	34.28
TARE	25000	12.50
NET	43560	21.78

F -183 FASSETT

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD # - 13 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288362

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:53:06-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	70120	35.06
TARE	31440	15.72
NET	38680	19.34

F #185 -COULSON-#185-

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD # - 14 Rec'd by

AR306181

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 3288263

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:54:20-12/29/95

Sold to CODE ENVIRONMENTAL .COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68080	34.04
TARE	28060	14.03
NET	40020	20.01

-GF TRUCK # 176

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD # - 16 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 3288364

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	8:55:02-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.	TONS
GROSS	69060	34.54
TARE	28460	14.23
NET	40620	20.31

-GF TRUCK # 177

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD # - 16 Rec'd by

AR306182

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD
328-5182

OFFICE
658-5241

No. 3209369

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:24:21-12/29/95

Sold to CODE ENVIRONMENTAL COD

Addr

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	68800	34.40
TARE	29240	14.62
NET	39560	19.78

-GF TRUCK # 171

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD # 17 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD
328-5182

OFFICE
658-5241

No. 0288370

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:32:30-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68100	34.05
TARE	28060	14.03
NET	40040	20.02

-GF TRUCK # 176

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK. — NUMBER: 057

LOAD # 18 Rec'd by

AR306183

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288371

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:33:26-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE. 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	74240	37.12
TARE	31300	15.65
NET	42940	21.47

184 -MATHIS #184

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 19 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288372

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:34:05-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	71760	35.88
TARE	31300	15.65
NET	40460	20.23

GF -187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 20 Rec'd by

AR306184

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288373

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:35:36-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	72900	36.45
TARE	31300	15.65
NET	41600	20.80

GF -186

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # 21 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288374

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:36:43-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	72660	36.33
TARE	31440	15.72
NET	41220	20.61

GF #185 -COULSON

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # 22 Rec'd by

AR306185

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288376

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:40:56-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	66520	33.26
TARE	28460	14.23
NET	38060	19.03

-GF TRUCK # 177

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD # - 23 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288377

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:41:54-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	66920	33.46
TARE	28440	14.22
NET	38480	19.24

-GF TRUCK # 178

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD # - 24 Rec'd by

AR306186

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288379

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:46:38-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	57160	33.58
TARE	31360	15.68
NET	35800	17.90

F #188 -188 LEWIS

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

OAD #- 25 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288380

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	9:47:04-12/29/

Sold to CODE ENVIRONMENTAL

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.	TONS
GROSS	61480	
TARE	25000	
NET	36480	

GF -183

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

LOAD #- 26 Rec'd by

AR306187

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 4288386

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	10:07:47-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	67960	33.98
TARE	29240	14.62
NET	38720	19.36

-GF TRUCK # 171

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD # - 27 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 4288388

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	10:16:01-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	65060	32.53
TARE	28060	14.03
NET	37000	18.50

-GF TRUCK # 126

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD # - 28 Rec'd by

AR306188

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288389

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	10:23:16-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE - 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	66240	33.12
TARE	31440	15.72
NET	34800	17.40

#185 -COULSON #185

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD #- 29 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288393

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	10:31:29-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	65840	32.92
TARE	28460	14.23
NET	37380	18.69

-GF TRUCK #177

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD #- 30 Rec'd by

AR306189

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288394

Purchase Order	Cash/Check/Charge	Divd	Date
		Y	10:31:55-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	68840	34.42
TARE	31300	15.65
NET	37540	18.77

-187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # - 31 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288396

Purchase Order	Cash/Check/Charge	Divd	Date
		Y	10:32:53-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	63080	31.54
TARE	28440	14.22
NET	34640	17.32

-GF TRUCK #-178

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # - 32 Rec'd by

AR306190

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288397

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	10:36:20-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	63680	31.84
TARE	25000	12.50
NET	38680	19.34

-183 FASSETT

CERTIFIED WEIGHTMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # - 33 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288403

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	11:00:28-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.	TONS
GROSS	69760	34.88
TARE	31300	15.65
NET	38460	19.23

GF -186

CERTIFIED WEIGHTMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # - 34 Rec'd by

AR306191

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288404

Purchase Order	Cash/Check/Charge	Dlvd	Date
	.	Y	11:03:23-12/29/95

Sold to CODE ENVIRONMENTAL .COD

Addre

De 600 TERMINAL AVE 600

ELECT/RIVER RD. -

	LBS.	TONS
GROSS	65500	32.75
TARE	31440	15.72
NET	34060	17.03

: #185 -COULSON #185

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

OAD #- 35 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288405

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	11:09:12-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS	TONS
GROSS	66580	33.29
TARE	29240	14.62
NET	37340	18.67

-GF TRUCK #III

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

LOAD #- 36 Rec'd by

AR306192

ORIGINAL
(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288408

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	11:17:07-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	62900	31.45
TARE	28460	14.23
NET	34440	17.22

-GF TRUCK # 177

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD #- 37 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288409

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	11:23:41-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.	TONS
GROSS	67400	[illegible]
TARE	31300	[illegible]
NET	36100	[illegible]

GF -187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 067

LOAD #- 38 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288410

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	1:24:06-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

E T/RIVER RD.

	LBS.	TONS
GROSS	63480	31.74
TARE	25000	12.50
NET	38480	19.24

-183 FASSETT

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD # - 39 Rec'd by W. Duley

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288411

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	1:24:56-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	65100	32.55
TARE	28440	14.22
NET	36660	18.33

-GF TRUCK #178

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

LOAD # - 40 Rec'd by W. Duley

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288415

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	11:43:15-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	65440	32.72
TARE	31300	15.65
NET	34140	17.07

-186

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

OAD #- 41 Rec'd by Joe Mangan

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288428

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	12:46:05-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.
GROSS	6452[illegible]
TARE	2846[illegible]
NET	3606[illegible]

-GF TRUCK 177

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK — NUMBER: 057

OAD #- 42 Rec'd by

AR306195

ORIGINAL

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0285431

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	12:50:36-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

[illegible]600 TERMINAL AVE 600

[illegible]ELECT/RIVER RD.

	LBS.	TONS
GROSS	62260	31.13
TARE	25000	12.50
NET	37260	18.63

[illegible] -183 FASSETT

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

[illegible]OAD #- 43 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288433

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	12:52:08-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD.

	LBS.	TONS
GROSS	66740	33.37
TARE	31300	15.65
NET	35440	17.72

[illegible] -187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK
NUMBER: 057

[illegible]OAD # 44 Rec'd by

AR306196

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288439

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:10:22-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Dr to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	67600	33.80
TARE	31300	15.65
NET	36300	18.15

F -186

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

OAD #- 45 Rec'd by

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288442

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:29:47-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE

SELECT/RIVER RD.

	LBS.
GROSS	68980
TARE	28460
NET	40520

-GF TRUC

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER

LOAD #- 46 Rec'd by

AR306197

(Red)

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE

RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288448

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:42:19-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS.	TONS
GROSS	64300	32.15
TARE	25000	12.50
NET	39300	19.65

GF -183 FASSETT

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # 47 Rec'd by

PARKWAY GRAVEL INC.
4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182 OFFICE 658-5241

No. 0288449

Purchase Order	Cash/Check/Charge	Dlvd	Date
		Y	13:43:57-12/29/9

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

ELECT/RIVER RD.

	LBS	TONS
GROSS	68820	34.41
TARE	31300	15.65
NET	37520	18.76

GF -187

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE: BETTY WYRICK

NUMBER: 057

LOAD # 48 Rec'd by

AR306198

PARKWAY GRAVEL INC.

4048 NEW CASTLE AVE.
NEW CASTLE, DELAWARE
RIVER ROAD 328-5182
OFFICE 658-5241

No. 0288451

Purchase Order	Cash/Check/Charge	Divd	Date
		Y	13:58:06-12/29/95

Sold to CODE ENVIRONMENTAL COD

Address

Deliver to 600 TERMINAL AVE 600

SELECT/RIVER RD

	LBS	TONS
GROSS	68900	34.45
TARE	31300	15.65
NET	37600	18.80

DAMAGED FENCE GATE + POST.

186

CERTIFIED WEIGHMASTER N. C. CO., DEL. SIGNATURE	NUMBER
BETTY WYRICK	057

LOAD # 49 Rec'd by W. Duke

AR306199

APPENDIX E

USEPA GENERATOR IDENTIFICATION NUMBER APPLICATION

To avoid delays in processing, please complete all sections.
Only original signatures of the Generator is acceptable.

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law (Section 3010 of the Resource Conservation and Recovery Act).

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)

I. Installation's EPA ID Number (Mark X in the appropriate box)

A. First Notification [ ] B. Subsequent Notification [ ] (complete item C)

C. Installation's EPA ID Number

II. Name of Installation (Include company and specific site name)

HALBY CHEMICAL SUPERFUND SITE

III. Location of Installation (Physical address not P.O. Box or Route Number)

Street: Requires Building Number or Latitude and Longitude for processing.

600 TERMINAL AVENUE

East (continued)

City or Town: WILMINGTON | State: DE | ZIP Code: 19720-

County Name: NEW CASTLE

IV. Installation Mailing Address (See instructions)

Street or P.O. Box: ONE AMERICAN LANE

City or Town: GREENWICH | State: CT | ZIP Code: 06831-2559

V. Installation Contact (Person to be contacted regarding waste activities at site)

Name (last): VYAS | (first): RAJNIKANT

Job Title: CORPORATE MNGR. | Phone Number (area code and number): 203-552-4726

VI. Installation Contact Address (See instructions)

A. Contact Address Location: [ ] Mailing: [X] | B. Street or P.O. Box: ONE AMERICAN LANE

City or Town: GREENWICH | State: CT | ZIP Code: 06831-2559

VII. Ownership (See instructions)

A. Name of Installation's Legal Owner (If Same as Above, Leave Blank)

BRANDYWINE CHEMICAL

Street, P.O. Box, or Route Number: 600 TERMINAL AVENUE

City or Town: WILMINGTON | State: DE | ZIP Code: 19720-

Phone Number (area code and number): 302-656-5428 | B. Land Type: P | C. Owner Type: P | D. Change of Owner Indicator: Yes [ ] No [X] | (Date Changed) Month: Day: Year:

EPA Form 8700-12 (Rev. 9-94) Previous edition is obsolete. -1- Continue on reverse

From: Jack Hoyt, AWMD, EPA, Region 2, 290 Broadway, 22 Fl.
New York, NY 10007-1866. Tel; (212) 637 4106

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 6-31-93
GSA No. 0246-EPA-OT

ID - For Official Use Only

VIII. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes. Refer to instructions.)

A. Hazardous Waste Activity

1. Generator (See instructions)
   - [ ] a. Greater than 1000 kg/mo (2,200 lbs.)
   - [ ] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [X] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

Mode of Transportation
- [ ] 1. Air
- [ ] 2. Rail
- [ ] 3. Highway
- [ ] 4. Water
- [ ] 5. Other - specify

- [ ] 3. Treater, Storer, Disposer (at installation) Note: A permit is required for this activity; see instructions.
- [ ] 4. Hazardous Waste Fuel
  - [ ] a. Generator Marketing to Burner
  - [ ] b. Other Marketers
  - [ ] c. Boiler and/or Industrial Furnace
    - [ ] 1. Smelter Deferral
    - [ ] 2. Small Quantity Exemption

    Indicate Type of Combustion Device(s)
    - [ ] 1. Utility Boiler
    - [ ] 2. Industrial Boiler
    - [ ] 3. Industrial Furnace
- [ ] 5. Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketer
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
- [ ] 2. Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

IX. Description of Regulated Wastes (Use additional sheets if necessary)

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40 CFR Parts 261.20 - 261.24)*

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. Toxicity Characteristic (D000)	(List specific EPA hazardous waste number(s) for the Toxicity Characteristic contaminant(s))

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
D004	D005	D001	D003		
7	**8**	**9**	**10**	**11**	**12**

C. Other Wastes. (State or other wastes requiring a handler to have an I.D. number. See instructions.)

1	2	3	4	5	6

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature	Name and Official Title (type or print)	Date Signed
	Rajnikant Vyas - Corp. Mgr.	

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section

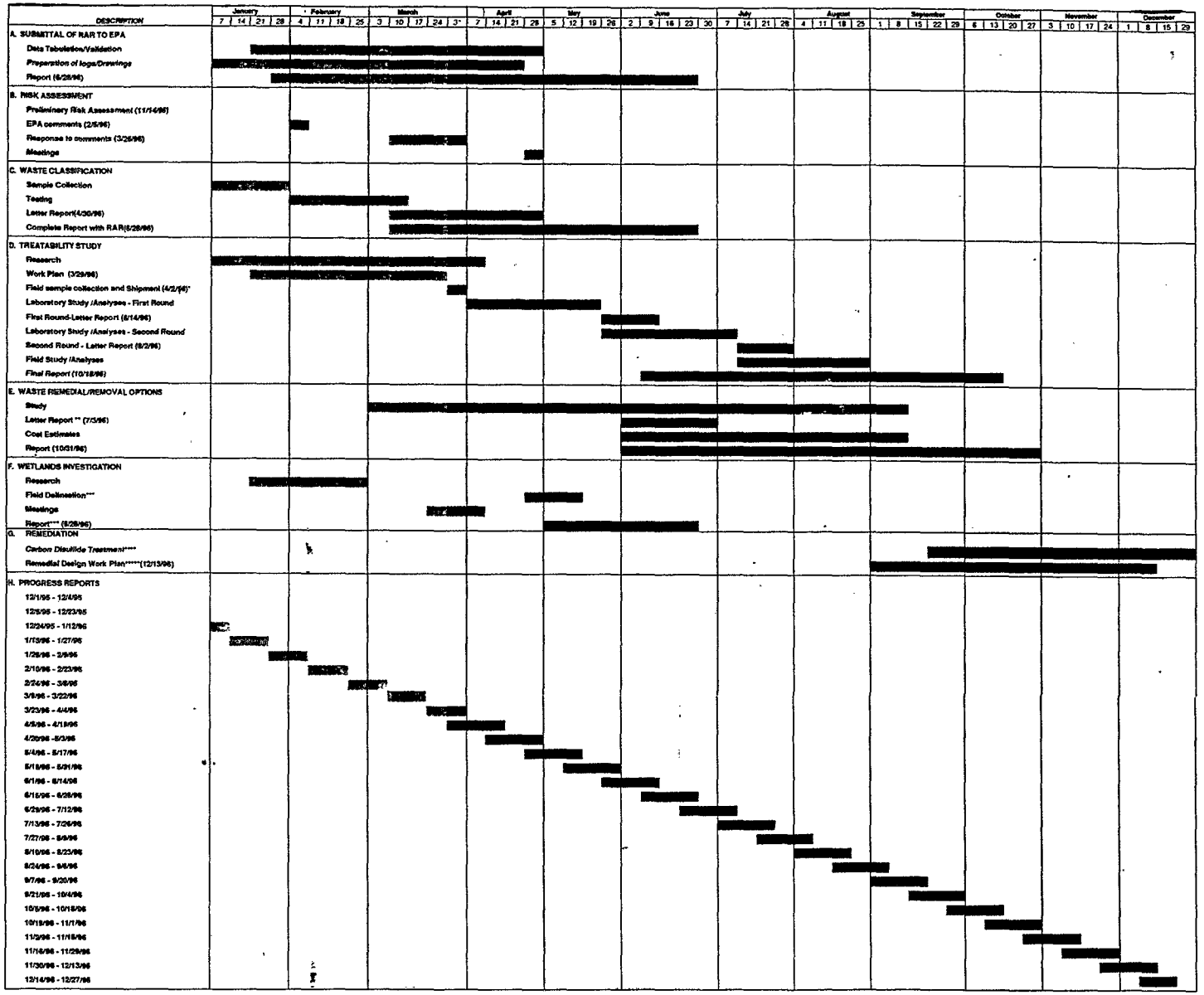
AR306202

APPENDIX F
PROJECT SCHEDULE

ORIGINAL
(Red)

AR306204

1996 PROJECT SCHEDULE
HALBY CHEMICAL SUPERFUND SITE
WILMINGTON, NEW CASTLE COUNTY, DELAWARE



Schedule denotes weeks starting on Sunday
* Sample collection will be postponed if rainy weather conditions are anticipated to avoid spread of contaminants
** Letter Report based upon First Round Treatability Results
*** Schedule contingent upon meeting with USEPA, DNREC, and ACOE
**** Assumes positive results from the Treatability Study
***** Work Plan includes remedial design other than carbon disulfide treatment

20618/SCHEDL2.XLS